

# THE IRON AGE

6 1936

FEBRUARY 6, 1936

THEY STOPPED PUTTING  
ENGINES IN BUGGIES  
FORTY YEARS AGO . . .



*But what has that to do with*

## ROLL NECK BEARINGS?

The extraordinary progress of American industry has largely been due to the promptness and consistency with which incorrect principles have been abandoned and new principles adopted.

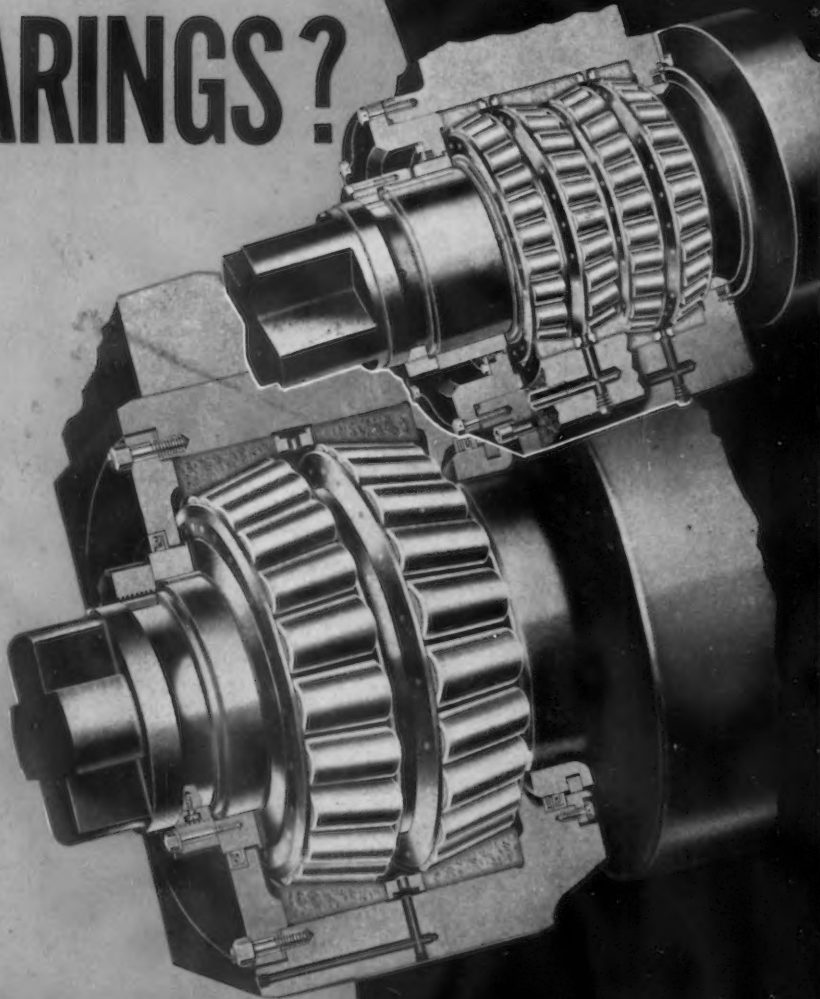
When automotive engineers stopped trying to make automobiles by building over horse drawn buggies and began to attack motor car design as an entirely new vehicular problem, the automotive industry went ahead by leaps and bounds. Imagine this industry on plain bearings!

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And when rolling mill engineers realized that if mill speeds were to be increased, bearing life extended and costs reduced, a radically different type of roll neck bearing would be required, friction was superseded by anti-friction — roll neck bearing hazards were eliminated and a new era of rolling mill operation was begun.

If a mechanical principle is fundamentally wrong, no amount of refinement can make it successful.

THE TIMKEN ROLLER BEARING  
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# TIMKEN *TAPERED ROLLER* BEARINGS

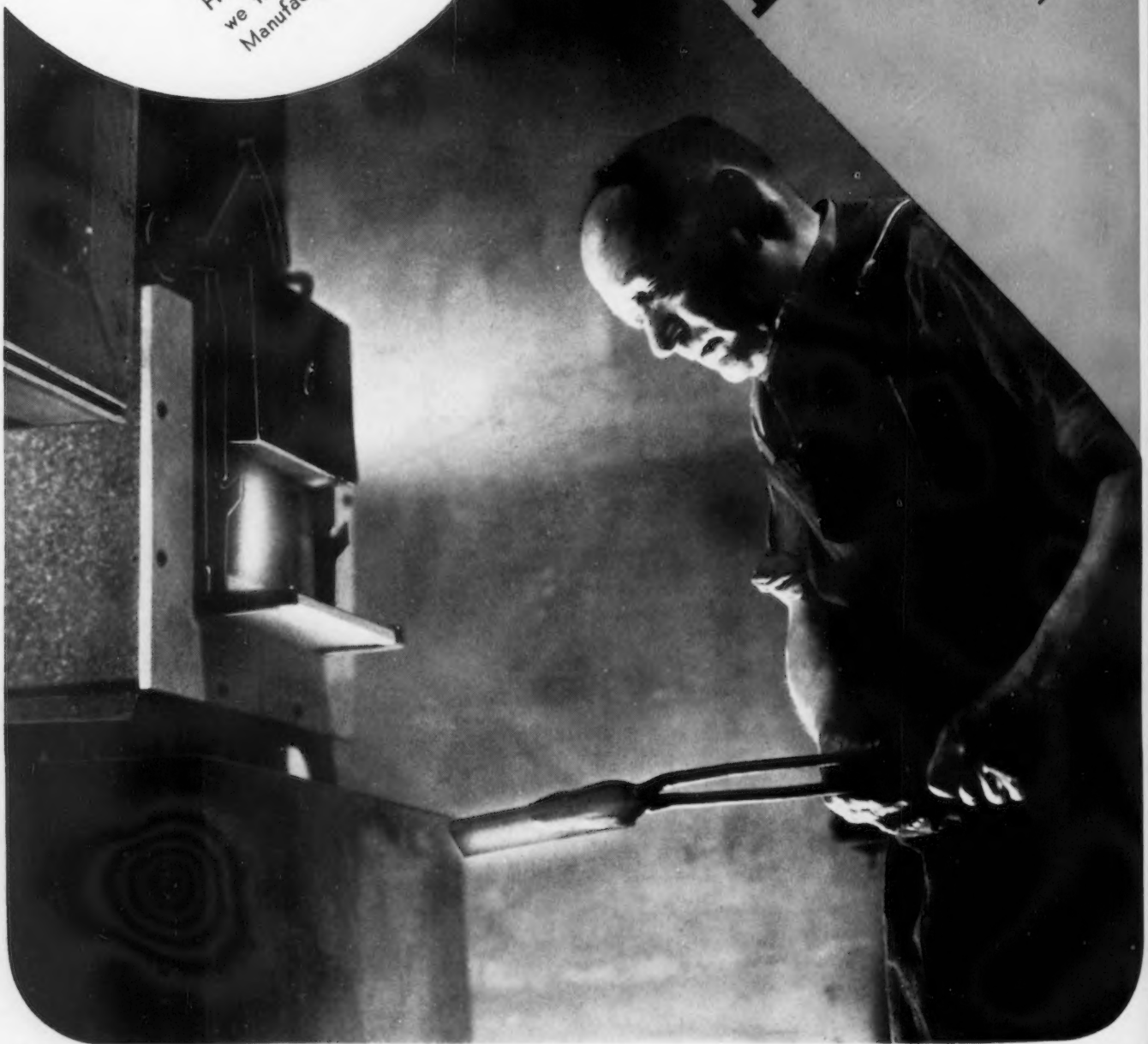
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Electrical Heat Possible



2—THE IRON AGE, February 6, 1936

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# THE IRON AGE

FEBRUARY 6, 1936

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## Let's Examine the Record

HATE is an ugly word.  
It does ugly things.

Fortunately, there is not so much of it in the world of business as some people believe there to be. A long and intimate contact with both sides of industry has failed to reveal an employer who hated his workers and mighty few workers who have really hated their employers in the ordinary conduct of their relations. Exception must be made, of course, for the handful of Communists in America whose religion is hatred.

Such people, however, do not count, for if there were no one else to hate, they would hate themselves.

Doctors tell us that hating is unhealthy. That it poisons the system of the man who indulges in it, ruins his digestion and shortens his life. It must be that the average American, high or low, realizes this truth instinctively, because normal people try as hard as possible to avoid it.

If a typical American workman wakes up to the fact that he hates his boss, he tries to find another one who will not arouse this unhealthy emotion. That is one of the advantages that the American System has over dictatorships where you cannot change jobs.

The charge has been made that the New Deal has encouraged class hatred, particularly between employer and employed. Such a serious charge deserves either disproof or substantiation by facts.

There is only one way that we can measure the intensity of antagonism between employers and employed at any given time and that is by the scarcity or prevalence of labor troubles as expressed in strikes.

The United States Department of Labor gives us an accurate measure of this, for it keeps a record of man-days lost because of such conflicts.

Here is the record by years, of man-days lost through strikes since 1930:

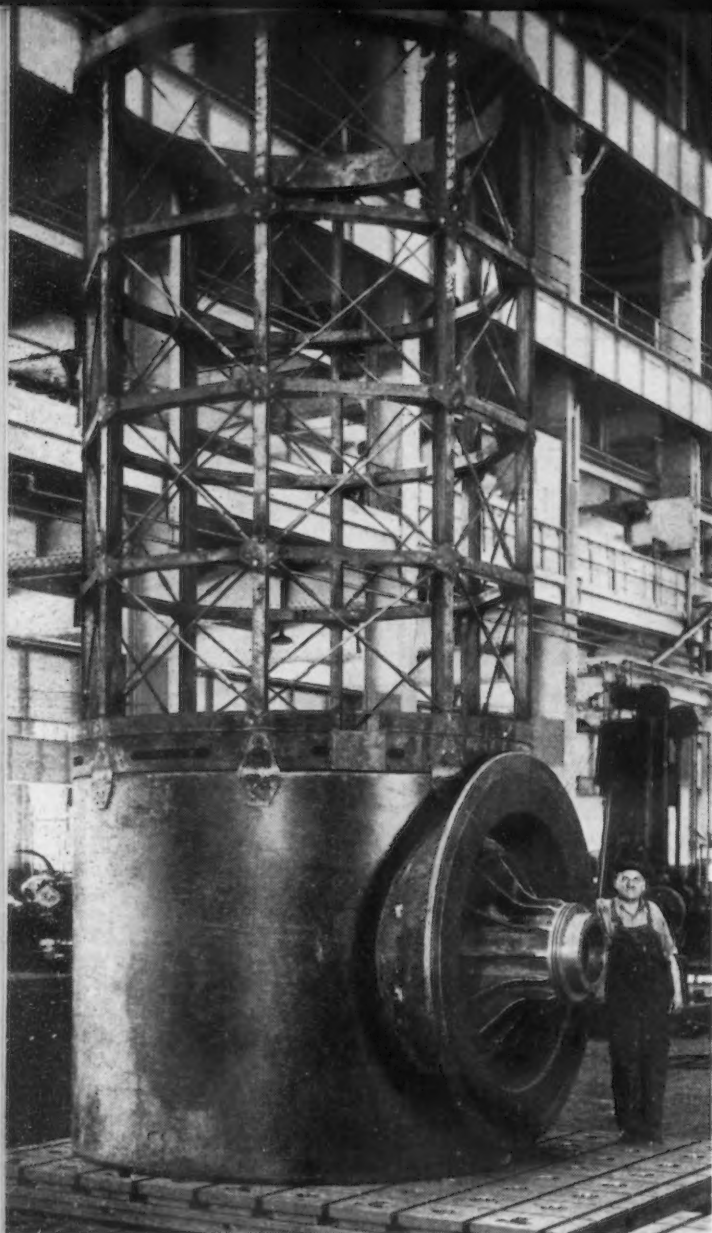
1930—	2,730,368
1931—	6,386,183
1932—	6,462,973
1933—	14,818,846
1934—	19,308,650
1935—	13,688,016 (first ten months available)

During the three years immediately preceding the New Deal, there were 15,579,524 man-days lost through strikes.

During the three years immediately following the New Deal, there were 47,815,512 man-days lost through strikes.

No matter how idealistic is its professed aim, any deal, old or new, that makes such a definite record of tripling the symptoms of class antagonism is not the kind of a deal that the average American will want continued. Hatred will ruin the economic system of a country as readily as it will poison the blood-stream of an individual.





# Welding in the Fa

By A. E. GIBSON

Vice-President, Wellman Engineering Co., Cleveland.

FIG. 1—Welded centerpiece and cylinder of the 82-in. telescope. After welding, the centerpiece was stress relieved at 1200 deg. F. and then machined.

not so easy. Located, as they are, usually at out of the way places, operated almost entirely at night, few laymen have the opportunity to see them.

Through the generosity of W. J. McDonald, a bequest of \$900,000 was made to the University of Texas for the erection of an observatory. The Warner & Swasey Co., Cleveland, builder of machine tools and telescopes for 55 years, was awarded the contract for the design and construction of the observatory and its 82-in. reflecting telescope.

This article has to do with the building of the larger parts of the telescope, particularly those fabricated by welding. This work was performed in the shops of the Wellman Engineering Co., Cleveland.

Several years ago, it was found

advisable to construct certain parts of the Perkins 69-in. telescope, designed by the Warner & Swasey Co. for the Ohio Wesleyan University, at very much lower weight than had previously been possible. To accomplish this, the Warner & Swasey company, consulting with the engineering staff of the Wellman Engineering Co., worked out a welded design which proved eminently successful from a weight-saving standpoint. Naturally, in designing this new and larger instrument E. P. Burrell, chief engineer, Warner & Swasey Co., selected welding as the fabricating medium for those parts where high strength, rigidity and low weight were essential.

Fig. 1 shows the centerpiece and cylinder of the telescope. The centerpiece, the lower section of the assembly, is the part which is attached to the polar axis. This part must be constructed so that deflection is reduced to a minimum. When it is considered that this detail, to which is attached the mirror cell (shown in Fig. 5) carrying the 82-in. diameter by 12-in. thick glass mirror, is revolved practically 360 deg. in both horizontal and vertical planes, it will be seen that rigidity and strength are of vital importance. The upper structure of Fig. 1, also of welded



ANYONE who has had the privilege of seeing the Planetarium in Chicago must have come away with a profound respect for the marvelous engineering skill and ingenuity built into a mechanism which is capable of reproducing, with marvelous accuracy, the travel of heavenly bodies.

While this interesting and instructive apparatus may be seen by anyone visiting Chicago, an inspection of the equally marvelous reflecting telescopes in America is



# Reflecting Telescopes

steel, is composed of octagonal shaped horizontal I-beam members welded to eight vertical I-beam posts. The tie rods and turnbuckles are of alloy steel welded at the panel points. The upper and lower rings of this cylinder were welded, stress relieved and machined before assembly. Due to the fact that absolute parallelism of the two faces was required, great care was necessary in securing alignment and freedom from warpage in welding. This was accomplished by working from true floor plates, using plumb bobs and accurate, over-all height pin gages.

## Centerpiece Construction

The centerpiece referred to above is shown in the drawing Fig. 2. It will be noted that the frame of this structure consists of a number of circumferential and vertical beams, interlaced and securely welded together, enclosed with a cover plate, forming a cylinder 104 in. in diameter by 82½ in. high. This cylinder is intersected by another cylinder at right

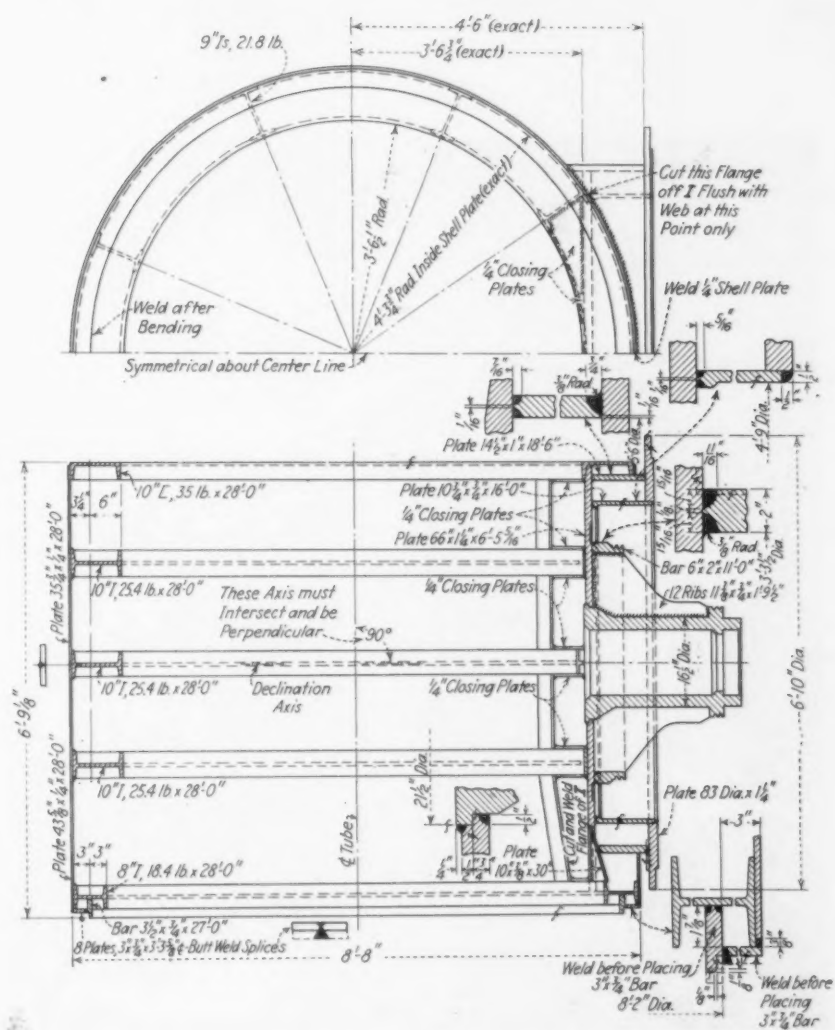
FIG. 2—Centerpiece of the telescope, constructed of circumferential and vertical I-beams. This welded structure consists of two intersecting cylinders with a forged steel spindle. Note the details of the welded joints, in many instances specifying welds of complete penetration of the metal.

angles, the latter having incorporated in its construction a forged steel center and seats for 54-in. and 14½-in. Timken roller bearings, also a flange ring to which is attached a worm wheel for turning in the vertical plane.

The horizontal circular ribs were

made of 10-in. I-beams, split in two sections, removing  $\frac{3}{4}$  in. of the web, rolled to the proper diameter and welded together to form circular beams 9 $\frac{1}{4}$  in. high.

Fig. 3 shows the fixture used to align properly the skeleton frame so as to secure the accuracy re-



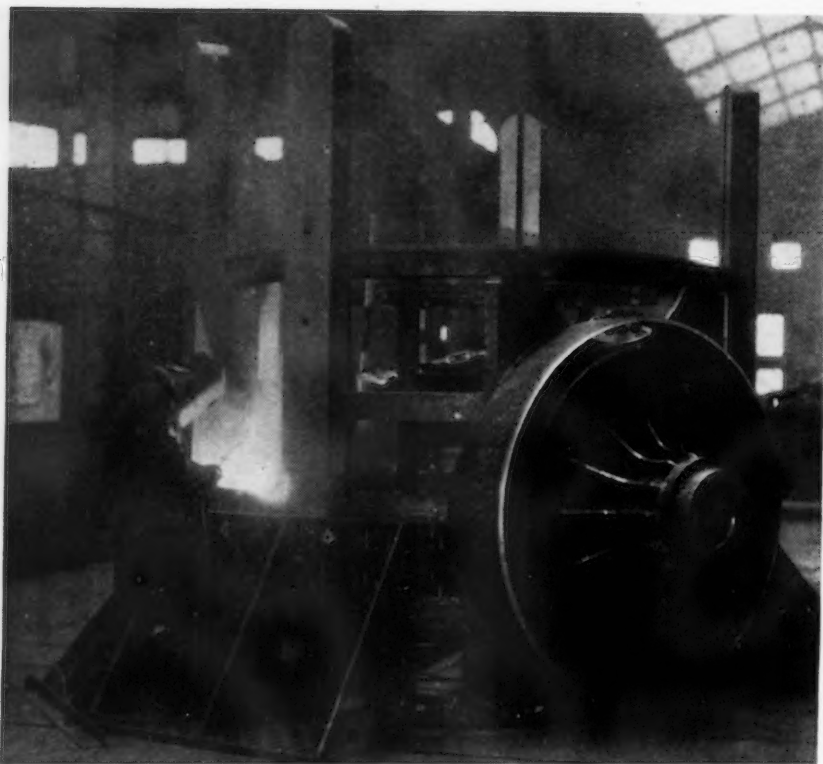


FIG. 3—The centerpiece was welded in fixtures to assure correct alinement of the various parts. After all parts were tacked securely, the centerpiece was removed from the fixture for completion of the welds.

quired. Referring again to Fig. 1, it will be seen that the two faces of the centerpiece are machined and must be exactly at right angles to the planes of the roller bearings. When it is realized that the vertical flange (against which the man is leaning in Fig. 1) at right angles to the main cylinder was not out of plane over  $1/32$  in. in the rough, an idea of the care required in welding and thermal stress relief is realized.

Fig. 3 shows the 0.40 per cent carbon trunnion forging welded to a 2-in. plate. The outer end of this forging forms the seat for the  $14\frac{1}{2}$ -in. diameter roller bearing. Immediately beyond the 12 radial ribs is located the heavy ring which provides the seat for the 54-in. roller bearing.

#### Welded Joints Stronger Than Rolled Plate

Referring to Fig. 2, it will be seen that all joints highly stressed are of 100 per cent penetration, reinforced where possible with fillet welds in order to obtain welded joint strengths greater than that of the rolled plate. From this

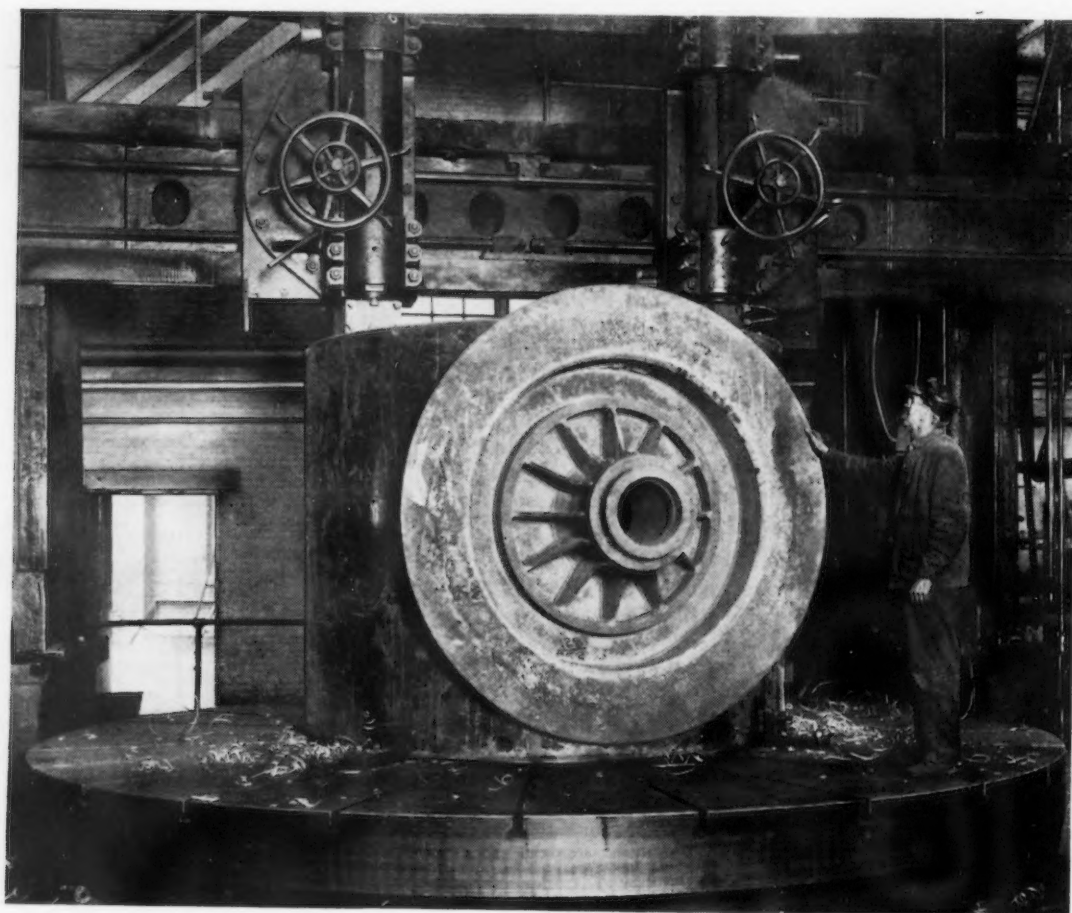


FIG. 4—Completed centerpiece being machined on an 18-ft. boring mill. This unit is 104 in. in diameter and  $82\frac{5}{8}$  in. high.



drawing, it will be noted that each joint is definitely detailed to show the preparation of the steel for welding and the amount of penetration desired. No detail of penetration, form of weld, type of electrode or welding current characteristics was left to the hunch of the welding operator. Every step of the welding procedure, including positioning of the parts during welding, was definitely planned.

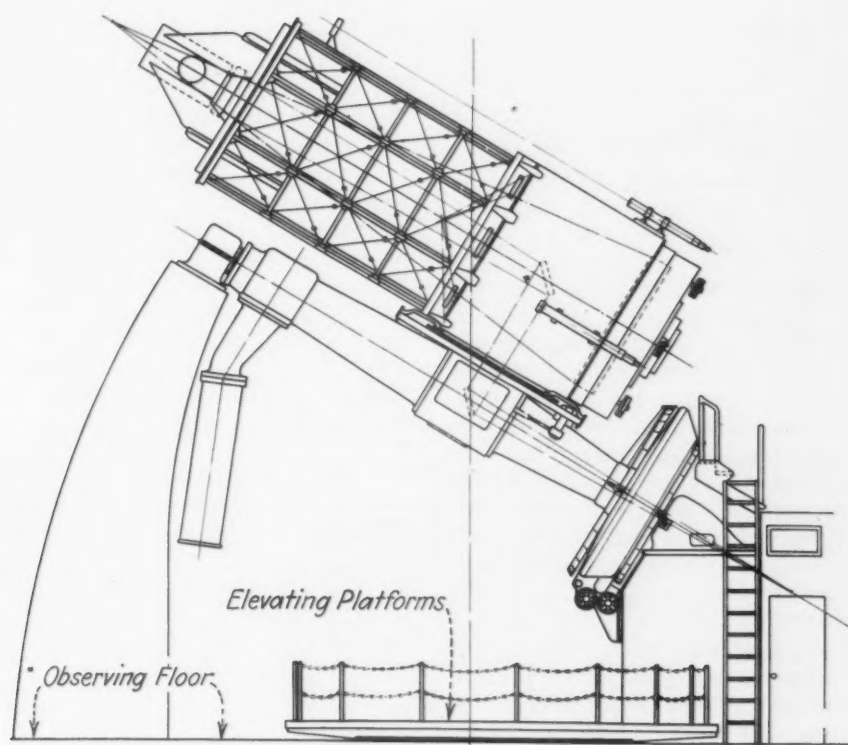
Fig. 4 shows the centerpiece being faced on an 18-ft. diameter vertical boring mill. Extreme care was exercised in these facing operations to assure proper alinement of the top and bottom flanges with the roller bearing seats. These seats were specified to be within 0.0003 in. out of roundness and 0.0005 in. in diameter.

The mirror cell used to support the 82-in. diameter reflecting mirror is seen in Fig. 5. This design consists of interlocking 6-in. H-beams as a base welded to a flanged cylinder. The completely welded structure was stress relieved at 1150 deg. F. before machining.

The ever-increasing progress of welded construction, where light weight, high strength and great rigidity are required, is indicated by this interesting piece of fabrication. When it is considered that the entire investment of \$900,000 depends, to a great extent, on the proper functioning of these two pieces of welded fabrication, the confidence of the designing engineer in the efficiency of welded construction is a fine testimonial to the progress of the welding art.



FIG. 5—Welded mirror cell for supporting 82-in. reflecting mirror.



ASSEMBLY drawing of the 82-in. reflecting telescope. The welded details shown in Figs. 1 and 5 can be seen supported by the polar axis.



# How to Cut Your Payroll Tax

*The one method for reducing the payroll tax  
which began New Year's Day*

By H. A. HARING



THE "Social Security" program was enacted in the closing days of Congress, last August.

Amid the welter of new laws, it attracted little attention among employers until January first approached. Upon that day the tax on payrolls became effective, rumblings of elaborate reports took form, and business suddenly awoke to the fact that the heaviest tax ever imposed is now upon us.

The plan of "Social Security" is history's most ambitious welfare scheme, going far deeper into relief than all previous laws lumped together. For revenue to support the relief, the new law follows the workmen's compensation method: it lays a tax on the payroll. But

the law is exceedingly complicated. The combination of unemployment insurance with old-age pensions is so confusing that a concern is at a loss to calculate the cost.

The tax for one purpose, unemployment, begins with the first day of 1936; for the other purpose, old-age pensions, one year later. Both taxes go up gradually with the years. Under the Federal law, the rates are as shown in this table.

RATES UNDER FEDERAL LAW

Calendar Year	Per Cent			
	Unemployment Tax: Paid Wholly by Employer	Old-Age Pension Tax: Paid by Employer	Employees' Income Tax: Paid by Employer and Deducted from the Workers' Pay	Total Tax
1936 .....	1	..	..	1
1937 .....	2	1	1	4
1938, 1939 .....	3	1	1	5
1940, 1941, 1942	3	1½	1½	6
1943, 1944, 1945	3	2	2	7
1946, 1947, 1948	3	2½	2½	8
1949 and thereafter .....	3	3	3	9

To these totals the states may add either for (1) the fund itself or (2) for the cost of state administration. Should the state tax be less than Federal totals, the employer must pay the Federal sum. If the state taxes him more, the burden on the employer is so much the heavier. In Wisconsin, for example, the 1936 rate is 2 per cent; in Utah, 3. Ten states, plus the District of Columbia, already have cooperating laws. Nearly every remaining state will enact a law within three months, because not to do so sacrifices the receipt of Federal money within the state. But, whether your state has a law or not makes little difference, because the Federal law catches you for the tax.

The second part of the new tax, that for old-age pension, is still a year away.

The first part, for unemployment, is already in effect. We shall, for that reason, confine our discussion of how to cut the tax to the



unemployment feature only. Nor shall we dig into the "benefits" to be paid employees laid off by the company — they being, in general, the payment of half the going wage for each week of idleness after a brief waiting period and, even then, covering about four months of each year of unemployment. Our thought will pierce more directly to the tax — that is, the price to be paid by you for protection to your workers.

### What Can We Do About It?

When you query your attorney, or your tax counsellor, "What can we do about it?" his reply is certain to be: "Not much." The fact is that escape from the whole burden is nearly impossible.

Hope is confined to methods for reducing the tax, under clauses in the law itself. Even then, the possibilities are limited to a single method—but a most alluring business opportunity for wide-awake management.

All the laws open with a clause of this sort: "The purpose is to promote regularization of employment in industry. . . ." Therefore, in the laws, although deeply hidden among the pages of detail, a sort of "saving clause" is held out to industry so that an employer may escape the tax (all but 1 per cent) by doing for himself what the law contemplates for society as a whole. If an employer will "regularize" or "stabilize" his employment, he will be let off from the major portion of the tax.

These two words—"regularize" and "stabilize"—for purposes of these laws seem to mean "prevent unemployment of your men" or "devise means to reduce lay-offs," or, as a final measure, "set up a schedule of unemployment benefits for your own men when idle through no fault of their own." Due allowance is made for idleness because of disputes or strikes, vacation work and seasonal employment, incompetent or dishonest workers, etc. We shall take no account of these problems, in order to examine the principal task, namely, that of guaranteeing regular employment to your workers.

The Federal law was, like many another, enacted in a hurry. Even Congress recognized that some employers already had insurance in effect for protection of their workers, and that others had for years guaranteed employment or paid

benefits when a lay-off did occur. In order to treat fairly these employers, Congress made specific provision for supplemental legislation to be based on investigation. The intention is to establish a "merit rating" or "preferred basis" for such concerns so as to relieve them of the new tax.

Perhaps the following is as clear a statement as any, coming as it does from Congress:

### Federal Policy

"Because unemployment is largely an economic problem beyond the control of an individual employer and because the policies of one industry often cause unemployment in another, to some extent all employers should be required to share one another's burdens. Recognizing, however, that unemployment is also due to policies of the individual employer and that to some extent he can stabilize his employment, the bill provides for a variation in contributions to the fund within certain limits."

The state of New York has appointed an Advisory Council of nine citizens, Massachusetts a "committee of citizens," and other states similar bodies, for the purpose, as stated in the law of New York: "Shall investigate and study the operation of this act with a view to classifying employers with respect to the frequency or severity of unemployment, to report on the practicability of a rating system, and to encourage the stabilization of employment in industry."

Yet another group of states have not hesitated to inaugurate at once a "merit rating." Wisconsin, for two years past, has operated such a plan. California, New Hampshire, Oregon and Washington have legislated plans almost identical even to tiniest details.

The purpose is to encourage employers to reduce lay-offs. An employer with a good record is rewarded—through reduction in his tax. Two methods prevail. Both are found, ordinarily, in the same law.

### Near and Far Rewards

First is the more distant reward, to be won after three years' trial of the new law. If an employer shows an excess of payments into the fund over benefits paid to his employees, his tax is reduced from the basic 3 per cent (which will be the

Federal rate in January, 1938). If this excess equals 8 per cent of the average annual payroll, the 3 per cent tax becomes 2½ per cent; if the excess amounts to 10 per cent, the tax drops to 2 per cent; at an excess of 12 per cent, the tax is 1½ per cent; and, for 15 per cent or more of excess, the tax drops to 1 per cent.

Second is an immediate relief from the full tax, under what the states call "guaranteed employment plans."

In such a case the law authorizes the Commission to exempt (from the tax and from other provisions clearly inapplicable to guaranteed employment plans) any employer who guarantees, under a plan approved by the Commission, "continuous employment" in advance for each worker, now employed or hereafter hired. "Continuous" does not mean exactly "uninterrupted" but, in the law's wording, the employed guarantees "for one-year periods, at least that number of weeks of work or wages for at least that number of hours each week set forth in the following table":

Minimum Number of Weeks per Year	Minimum Number of Hours in Each Such Week
42	36
43	34
44	32
45	30
46	28
47	26
48	24
49	22
50	20

These "Hours" in Column 2 vary slightly as among the states. Each employer, in addition, is required to specify the wage rate both for active service and for "unemployment wage benefit." And, uniformly in the laws, is the phrase: "Provided, the Commission is satisfied that the employer can and will make good his promise under all circumstances."

### Trend of Legislation

These two methods show the trend of lawmaking. Indications are that the Federal law will incorporate a similar "encouragement" to employers. Several states, including New York and Massachusetts, are likely to alter their laws, after this same pattern, before the first payment of the new tax falls due, March 31. But, whether they act thus promptly or not becomes a

(CONTINUED ON PAGE 93)

# Application of Gas-Fired Radiant T

By E. F. GEHRIG

*Assistant Superintendent, Detroit  
Michigan Stove Co.*



THE Detroit Michigan Stove Co. is the manufacturer of the well-known Detroit Jewel, Garland and Laurel lines of gas cooking and heating appliances. It also makes the Jewel and Garland lines of gas hotel ranges and broilers. Millions of American homes, restaurants, hotels and in-

stitutions are using these appliances, the manufacture of which started more than 70 years ago.

The equipment required to produce these appliances has undergone constant changes, just as the designs of the stoves change from year to year. Perhaps no equipment has had more changes from an engineering standpoint than the enameling furnaces in the enameling plant.

For some time the equipment has consisted of six gas fired, box type muffle furnaces and one continuous hairpin type enameling furnace.

Although both of these furnace types represent the best in design and engineering as we know today, yet, as a matter of fact, they still have certain deficiencies. Heat to the ware in the furnace chamber is transmitted through a muffle, which at its best, is inefficient. Muffles are not impervious. Sooner or later cracks appear and products of combustion enter the burning chamber and since the atmosphere surrounding the ware is then very uncertain, various contemporaneous difficulties arise in connection with firing the ware.

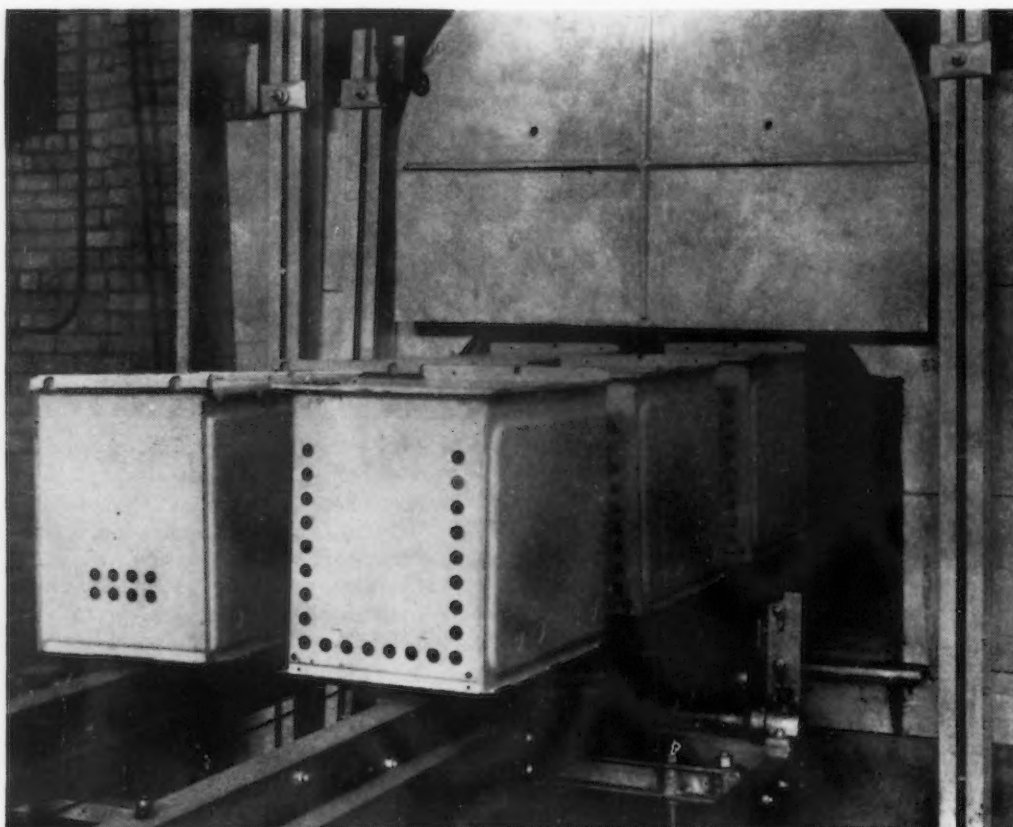


FIG. 1—Gas range ovens entering a radiant tube enameling furnace.

# nt Tubes to Porcelain Enameling

## *New Development Offers Many Advantages to Enamellers*

The method of applying heat and the resulting furnace atmosphere are chiefly responsible for the physical appearance of the enamel surface as well as the bonding of the ground coat. A strictly oxidizing furnace atmosphere is the prime requisite for best operating results. Muffle repairs or replacements are barriers against continuity of operation. They are costly and often are the cause of unexpected breakdowns. Electric furnaces have on the whole a fine record of performance despite the fact that operating costs are high and the danger of shutdowns caused by short circuits is always prevalent.

Over a period of years there have been a number of improvements in gas fired enameling furnaces. However, studies instigated by the Committee on Industrial Gas Research of the American Gas Association indicated that rather radical changes in design of methods of applying gas heat were possible and that these changes gave promise of incorporating every feature of electric furnaces with some advantages over the latter, notably lower operating cost. The Committee reached the conclusion that these objectives could be obtained by heating enameling furnaces with gas fired radiant tubes placed in the furnaces in a manner similar

to the way electric heating elements are installed. Gas fired radiant tubes in the past few years have been developed to the point where practically any heating capacity can be readily taken care of. The adaptation of these tubes to enameling furnaces represented, first, an engineering problem and, second, the need for demonstrating the practicability of this whole method of firing.

Gas has always been used in many enameling installations but, perhaps, with some degree of uncertainty or haziness as to the effect on the ware. However, with gas fired radiant tubes, the furnace atmosphere becomes as free from



FIG. 2—Method of arranging radiant tubes within a porcelain enameling furnace.



contamination as any existing type of enameling furnace on the market today.

The conversion of the furnace merely entailed removal of the furnace muffle and its substitution by radiant tubes. The result was a gas furnace possessing every advantage of electric heat as applied to static surface heating. Fig. 1 shows work entering a furnace of this type, and Fig. 2 gives an idea as to the arrangement of the radiant tubes in the furnace.

The furnace has now been in continuous operation for over four months, and the results obtained are very gratifying both from a production and economical standpoint. The work performed has been of equal quality, if not better, than that obtained from a full muffle furnace. The more lustrous gloss produced in the radiant tube furnace is attributable to the strictly oxidizing furnace atmosphere which is at all times free from harmful gases and a very necessary requirement for vitreous enameling. In fact, gas radiant tubes as the heating agent for porcelain enameling are not only practical but basically economical because of the high radiant heat emissivity of alloy tubes and the proximity of the work to the source of heat.

The working dimensions of the box type furnace were not affected by the conversion. There are six hairpin type radiant tubes installed, four on the furnace hearth as support for the work and one on each side wall. The tubes are fired from the rear of the furnace by means of special diffusion gas burners, as indicated in Fig. 3. The operation of the radiant tube is very simple and easy. The tubes are at all times under negative pressure or suction, which is produced by injecting blower air into a small stack or eductor at the end of each tube. This suction serves three purposes. First, it permits the fuel gas entering the firing end of the tube to draw in just enough air for complete combustion, and second, it preserves the non-turbulent flow of the highly luminous flame thus developed throughout the entire length of the tube which assures uniformity of heat distribution. Third, it maintains a negative pressure within the tubes with the result that there can never be any discharge of combustion gases

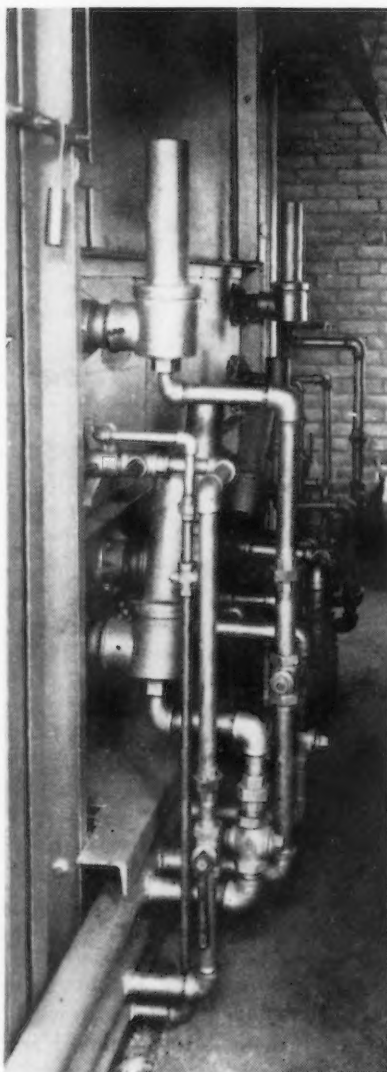


FIG. 3—Rear view of a radiant tube enameling furnace showing the location and arrangement of burners.

into the working chamber of the furnace.

Combustion within the tube can be maintained almost to the point of lowest flue loss. This is quite evident to the enameler who has been accustomed to see red hot gases belching forth from the flues of a muffle furnace. The tubes operate with perfect safety both ends of the tubes always being open to the atmosphere. Adjustment of the burners can be maintained easily.

Maximum temperatures inside of the tube wall do not exceed 1850 deg. F., which is sufficient to produce a furnace or outside tube temperature of 1600 deg. F., at which temperature our furnace is generally operated. Compared with muffle furnaces, temperatures of 2000 to 2200 deg. F. are necessary to obtain 1600 deg. F. in the furnace

proper. These figures undoubtedly represent economies in fuel consumption, yet producing a normal comeback which indicates that the important contributing factor lies in the rapid heat transmission of the alloy tubes upon which the ware is placed and burned.

In every batch type porcelain enameling furnace there is always a drop in temperature caused by opening the door, together with the weight of the cold material when charging a new load. The time required to regain the original temperature is commonly termed the "come-back" of the furnace. In any new type of furnace, the pertinent question asked is, "What come-back has this furnace?" The gas-fired radiant tube enameling furnace has a normal come-back as compared with a muffle furnace. This was demonstrated by running the same charge at the same temperature by the same operators for more than a three-day period. So one can say that the stored heat in muffles is not altogether necessary to produce a normal come-back. If the box furnace has sufficient depth in its walls together with a good layer of insulation, these walls then provide sufficient stored heat to compensate for the sudden drop in temperature. This is highly augmented by the fact that the radiant energy released by the tube is directly transmitted to the ware itself, giving extreme flexibility in operation.

Door losses are dependent on the lift of the door and can hardly be altered owing to the loading conditions and the shape of the ware which determine the duration and height of the lift. However, the loss through the door itself, the door openings, etc., can be materially minimized by the use of proper design and insulating material.

The heating-up period of the gas-fired radiant tube furnace is as fast as one might desire as the heat is readily transferred to the effective areas inside of the furnace. A clearer idea can be ascertained from the week-end heating-up curve given in Fig. 4, which shows a comparison between the two furnaces, muffle and radiant tube. On the contrary, the cooling-off (Fig. 5) of the radiant tube furnace over week-end shut downs for instance, is much slower than one would anticipate in view of its rapid heat-





Photo by MUDD of the Midvale Co.

# Steel Castings

o o o

"WE'LL Make a Good Steel Casting," is the title of this picture. And if a good casting is to ensue, a foundryman must have steel made by the most controlled and modern practices, molds and cores must be used intelligently and efficiently, and, equally important, the design of the casting should be such as to enable the molten steel to solidify progressively and correctly. If all of these variables are intelligently handled, the resultant casting can, in many cases, compete satisfactorily with forgings

o o o

▼ ▼ ▼



FROM time to time one hears of a comparison made between steel castings and forgings of similar chemical composition, often derogatory to the former. Only this year Dr. Hatfield, the eminent British metallurgist, replying to a question as to whether steel castings could in some conditions replace forgings satisfactorily, used an unequivocal "No." He qualified his definite opinion by an explanation, often used in

\*Abstract of paper presented before the Cleveland Chapter of the American Society for Metals.

this country by the present speaker and others, detailing the varieties of section and shape influences which must be considered when a casting is made.

There are two reasons which could possibly be advanced for any assumed superiorities of forgings: First, the influence of mechanical work on the structure of the steel, and, second, the influence of design on solidification phenomena in the case of the castings. This paper was written to emphasize the fact that by far the more important of the two is the second, and that the condition is not by any means beyond remedy.

To illustrate this point, consider the physical properties exhibited by sand-cast test blocks, heat-treated correctly and in various ways. First, it must be remem-

bered that these blocks are designed to feed solid, and this means that after pouring they solidify progressively from the bottom and sides, fluid shrinkage being cared for adequately by an ample riser. Thus there is obtained a condition of controlled design, and a body of cast metal made in a sand mold not subjected to any mechanical work such as rolling or forging, which could change or affect the microstructure.

It becomes sound argument, therefore, that any physical properties obtained by treatment of a thermal type only are a direct reflection of the susceptibility of cast structures to the modifying influence of heat treatment. *Thus any shortcomings in the physical properties manifested, when compared with similar forged steels,*



# —Properties and Design\*

By FRANK A. MELMOTH

Vice-President, Detroit Steel  
Castings Co.

could, by the same token, legitimately be credited to the absence of mechanical work, assuming design and feeding were perfectly arranged for.

The writer has prepared and tested a series of cast steels which have been produced under most favorable conditions. Of course the physical tests do not equal in every detail the optimum figures obtainable from perfectly forged and treated samples of steels of similar analyses. But the tests did, however, generally exceed specification demands imposed upon forgings, thus indicating an exceedingly good response to heat treatment as applied to cast structure.

Logically, then, this indicates that judging purely by results obtained from a perfectly designed and poured sand-cast block, there would appear no reason why steel castings should not encroach on many fields hitherto looked upon as almost sacred to forgings.

Assuming these statements to be founded upon facts, and it is believed they will be confirmed by all steel foundrymen who have carried out exhaustive tests from their material, we must look elsewhere than at the effect of mechanical work on structure for any assumed or accepted advantage of forgings over castings.

## Individual Design

In my opinion the onus is thrown straight back to the question of individual design. Many members

of the steel foundry industry have stressed this point repeatedly, and at the risk of being accused of tiresome repetition, it is proposed to go over this question again, with probably a few added suggestions.

Steelmaking, whether the product is ultimately to appear in a worked state, that is rolled or forged, or cast to shape without mechanical work as steel castings, consists of an identical state of affairs, or combinations of controlled reactions. It is even possible that owing to the respect in which a steelmaker attached to a foundry holds the unbalancing effect of sand molds, such a steelmaker increases his degree of care, as against the maker of cast steel ingots.

In the case of cast steel ingots, however, the shape of the piece to be cast, and therefore its solidification progression, has been arrived at by careful investigation, and the steelmaker possesses a perfect control. In other words, he can make an ingot suitable not only to the ultimate formation of the desired forging, or rolled product, but also so shaped as to give the molten steel every opportunity to solidify progressively and correctly. The engineering designer responsible for the ultimate shape of the product designs merely the forging, but his efforts are little, if at all, related to the solidifying conditions of the molten steel.

Steel casting practice, however, is considerably different. The form in which it is cast is exactly that

in which it is put to service, apart from any machining effects. Therefore the person controlling its design, shape and contour definitely has predicated its mode of solidification throughout and from point to point.

This one factor has been the basis for the statement repeatedly made by the founding industry, that all designers dealing with castings need an adequate knowledge of solidification phenomena. Where the appreciation of difficulty, brought about by such knowledge, does not exist in the designer, foundries as a whole are driven to all kinds of artificial methods in order to approach sectional soundness as nearly as possible by overcoming the natural and unavoidable changes occurring during solidification.

The curse of the entire founding industry is orthodoxy of design. It has never seemed logical to the present speaker to consider forgings and castings in the same plane of general shape and sectional distribution. If one adopts this form of consideration, then it becomes reasonable to emphasize the inefficiencies of the cast form as compared with the worked form, as, obviously, only the latter has had the advantage of considered design applied during manufacture.

Locally, therefore, a casting suffers from poor solidification conditions to a degree dependent upon the success or otherwise of the contrivances used by the foundry. In these conditions, the inherent

properties of the metal used cannot be demonstrated either in test or service conditions at all parts of the casting, and are only potentially present. To the foundryman, and possibly to most engineers, this prompts the query as to whether the condition necessarily need be so, or is a remedy possible. The answer is that generally speaking, almost all designs are capable of improvement, viewed from a foundry standpoint. This statement may appear somewhat extreme, but can be demonstrated as correct quite easily.

### Solidification Phenomena

During the last few years there has been a marked tendency in the literature of the steel founding industry to study the facts of solidification with a view to determining their effect on steel casting soundness, and, coincidentally, the influence of design upon solidification. The reader is referred especially to the papers by Briggs and Gezelius, of the Naval Research Laboratory, which have been presented annually to the American Foundrymen's Association, and the paper by George Batty, Consultant on Steel Castings, Philadelphia, submitted this year to the Institute of British Foundrymen.

The work of these authors is of immense benefit to steel founders, as it is actually replacing a lot of loosely held ideas by established facts. It must be admitted that this is all to the good, but I believe that the real value of their work never can be fully manifested until the designer also gives them the necessary study and application.

After all, by controlling shape and section, he alone controls solidification progression in all castings, always excepting the influence of various expedients utilized by the founder which are often inspired by desperation.

These remarks may convey to my listeners an impression that the steel founder labors under a burden of heavy technical difficulties in the production of his product. And there will be curiosity as to what extent he has succeeded in overcoming them, as evidenced by the reliability of his product.

In the ten years from 1920 to 1929 inclusive, 11,921,470 tons of steel castings were produced in this country, or an average of over one million tons per year. These

castings were absorbed by the various branches of the engineering industry in such a widespread fashion that it is true to say that almost every unit of the immense population of this country trusts his or her life to the dependability of steel castings every day. Every steamship and every locomotive, every freight and passenger car, commercial truck, and even many aeroplanes contain in some vital part examples of the steel founding art. Every power station and every bridge literally places its dependence upon steel castings, and it is a fair statement to say that the rarity of cases where such reliance is ill-placed is remarkable. Breakdowns due to lack of dependability of steel castings is at least as infrequent as in the case of any other constructional material.

This suggests that the steel founder has done a good job of overcoming, by his own efforts, the drawbacks enumerated previously, and also opens up grounds for conjecture as to just how far steel castings could go were the facts fully appreciated, and steps taken to design and use them in the light of up-to-date knowledge.

### Good Steel Imperative

Obviously it is perfectly futile to attempt the manufacture of any steel casting unless steel made by the most controlled and modern practices is available. For a steel casting is used without any mechanical work, such as forging or rolling, and the steel must be in such condition as to solidify with as perfect a structure as possible, and must also be free from unsoundness in the casting itself, such as shrink cavities and blowholes. Thus this requires a completely deoxidized product as an essential, that is, when viewed from a normal standard of deoxidation.

The steelmaker of a steel foundry must have before him prominently the following requirements:

**Regularity of Analysis:** Castings are almost invariably purchased as individual and specific

requirements of a design shape to meet certain fixed conditions. There analysis is so determined, together with heat treatment, as to produce a part exhibiting in itself a certain physical strength. It follows, therefore, that it is extremely unlikely that any casting of a "misfit" analysis can be put into stock and used against some other and future requirements, and consequently they are definitely scrapped. Such conditions involve melting methods of an organized and controlled type so as to maintain analysis within the specified range at all times.

**The Requisite Metal Temperature for a Job to Be Poured:** As compared with ingot practice, sand castings vary so much in design and metal thickness, and the effect of pouring temperature is so considerable, that steel must be made in full knowledge of the type of work in hand, and temperature adjusted accordingly.

**Complete Freedom from Gases:** In passing through a sand mold, particularly if such a mold is made of green sand, molten steel is subjected to many disturbing influences. It is therefore very necessary that the steel should be so made as to possess a margin of safety against these unsettling influences. If this margin is not present, disastrous unsoundness appears in the casting.

**Freedom from Excessive Amount of Non-Metallic Inclusions:** Quite a number of papers have been presented before the American Foundrymen's Association relative to cause and effect of non-metallics in steel for foundry use. For our present purpose, it is sufficient to say that a clean steel is a decided adjunct to the production of good castings. Aside from their effect on physical properties, as exhibited by test bars, non-metallic inclusions, more particularly if of the striated, stringy type, appear to cause foundry trouble such as unusual liability to cracking. It is perhaps debatable whether or not this is due to the direct influence of the inclusions themselves or to some incorrect condition, of which the inclusions may only be an outcome or corollary.

Acid electric steels, which are very popular for steel foundry use, have been particularly prone to this trouble, and much work has been done in the last few years to determine causes and to stabilize



operating conditions less likely to produce inclusions of a definitely harmful type.

### Melting Equipment

Regarding steel producing processes used in the modern steel foundry, every method in use in other branches of the steel trade is in common use. The class of melting equipment is dependent upon the type of work made by the individual foundry. Makers of heavy castings, of course, find the open-hearth furnace, either acid- or basic-lined, according to preference and available material, most suited for their purpose. A converter, usually side-blown, is still in use in some steel foundries, and in capable hands is an excellent piece of equipment for light and medium sized work. The electric furnace has many supporters owing to its elasticity of operation. In almost all cases it is acid-lined. For the manufacture of steel castings of the high alloy content, the more modern induction furnace is in use in many foundries.

As a matter of interest only, I had the good fortune when in Europe this year to be present for several days at what might be called the steel foundry christening ceremonies of the rotary type powdered fuel melting furnace. Excellent steel was produced and poured into castings, and, while it is true that there exist many points on which further development work is necessary before such a furnace will take its full place as melting equipment for steel, yet it is equally true that the results are so promising that such an outcome in due time is almost certain.

### Alloy Steels

The steel trade generally is now living in what might be termed only the beginning of an alloy age. Engineering development has wrought rapid changes in demand on steel foundries, and for many purposes the margin of capability over service demand in straight carbon steels was soon exhausted.

Steel foundries generally have been prompt to develop steels able to fit the new conditions, and almost all classes of alloy steels can now be obtained in cast form. It is realized that alloy additions, as such, mean very little, and that ultimate satisfaction in service behavior can only be the result of a combination of well-made steel

with a balanced alloy content which is subsequently adequately heat-treated.

The growth of interest in alloy steels, and the remarkable results to be obtained by their use, have been a great factor in making steel founders metallurgically minded. The foundries of today are staffed with men of a very different kind of training from that normal in the past. The past ten years have seen more research, directly applied to steel casting problems, than ever before, and this research is continuing at a rapid pace.

Steel founding is an exceptionally complex business, and the multiplicity of factors which can adversely affect the product are all correlated. Research on any one phase, therefore, necessarily must constantly keep in mind the possible effect of many other phases and their variations.

Leaving aside the purely mechanical side of production, which is largely an engineering problem, research falls into four main sections, namely, (1) steelmaking for castings, (2) control of solidification after pouring, (3) material for molds and cores and their effect, and (4) final heat treatment.

In the first of these items much progress has been made. It is realized that control of composition, control of quality, and type of non-metallic inclusions, while important, do not by any means cover the field of necessary research. The influence of temperature is also very significant, but the main requirement is undoubtedly the production of steel as immune as possible to the unbalancing effect of the mold into which it is poured, and as free from weakness after solidification as possible.

These requirements are not necessarily controlled by orthodox composition. The method of production of the steel would appear to exert quite an influence. For instance, it is known that steel produced without regard to perfect condition of both slag and metal,

in the final stages of manufacture, although by analysis showing the correct proportions of the normal elements, is very liable to cracking in the mold during cooling. A promising field for research, therefore, are the conditions affecting inter-crystalline strength at temperatures just below solidification, a period where most cracking of steel castings seems to occur.

Fluidity, also, is a vital point to the steel founder, and here again it has been known for a long time that the method adopted in the melting furnace exerts an influence quite apart from orthodox composition and temperature.

It is fully fifteen years since George Batty and the present speaker put forward the above suggestion, together with ideas of control as applied to the electric furnace, only to meet with the most profound skepticism. It is, however, somewhat interesting to observe that some of the most active critics of our conclusions at that time now speak quite casually of the lack of definite relationship between fluidity and temperature only.

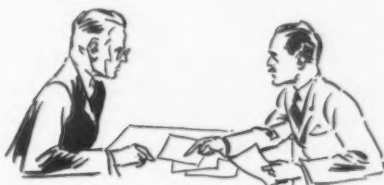
The second promising field for research, the control of solidification, probably is the one which exerts the greatest possible effect on the progress of the steel founding industry, and, as previously stated, this factor is very largely one of design.

Methods of feeding and gating, speeds of pouring, condition of mold during pouring and solidification, considered separately, and the chilling effect applied locally are each and all the subject of constant investigation by steel foundry technicians.

The object of all of it, of course, is to produce as nearly as possible progressive solidification in a casting so that the solidification proceeds steadily to one or more convenient points where feeder heads safely can be attached to care for the ultimate liquid shrinkage.

Uniformity of section is not the answer, in fact, the reverse easily might be true. The tapered ingot mold, cast wide end up, is a perfect example of where a departure from absolute uniformity is followed by solidification conditions favorable to soundness.

In the opening part of this talk  
(CONTINUED ON PAGE 94)







VAN STONE machine and furnace in which pipe is heated.

## Van Stoning and Bending Pipe



LARGE and heavy pipe made to withstand high pressures and high temperatures when fabricated is usually made up with flanges on the ends, and the various lengths are bolted together with gaskets between. The forging of these end flanges requires special furnaces and forging machines or power presses, and this method is known as Van Stoning. This type of joint is used universally throughout the power and refining industries.

One of the world's largest fabricators of pipe for refineries, making up such items as headers, coils, bends, etc., is the Midwest Piping & Supply Co., with two plants in St. Louis and one each in Passaic, N. J., and Los Angeles, Cal.

The St. Louis fabricating plant

By J. B. NEALEY

*American Gas Association*

is housed in a building covering 2½ acres, being 420 ft. long with an average width of 265 ft. Two switch tracks from the Manufacturers Railway and one track from the Missouri Pacific Railroad run into the building and there is a private manufacturer's service switch along the entire frontage.

One switch delivers incoming carloads of raw material to the warehouse for distribution to stock, while the other two serve the loading floors on outgoing carload ship-

ments, one in the fabricating and one in the pipe coil departments.

Motor-operated traveling cranes serve each of the four bays with a cross craneway connecting the center two.

Boom or jib cranes, motor operated, are placed so as to serve all machines, and any length of pipe or fabrication up to 36 ft. can be moved about with ease. All of the flange work is accomplished with a single Van Stone machine as it is adjustable to any size of pipe. But it requires three furnaces to heat the different sizes.

These furnaces are all fired with gas fuel, and are of brick construction, circular in shape and just long enough to accommodate the short length of pipe that must be heated prior to forming the flange. The largest of these furnaces is 4 ft. in diameter and 2 ft. deep or

long. It consists of a steel shell lined with firebrick and sets on 2-ft. legs. A hook in the top is employed in moving the furnace about the plant.

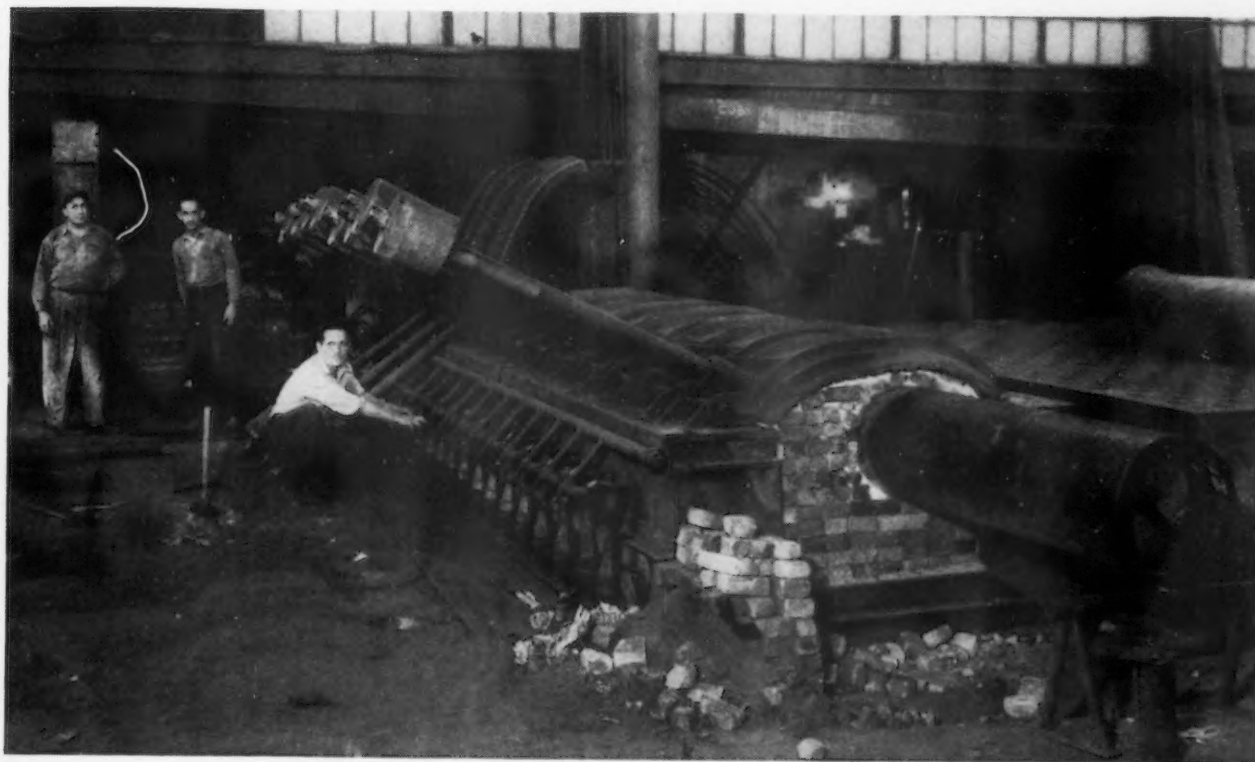
Eight gas burners are necessary to heat this furnace and these are spaced equally about the outside close to the front end and fire into the furnace. Gas is supplied to each burner by a  $\frac{3}{4}$ -in. pipe, which runs across the side and back to a 12-in. manifold in the center, all of the burner gas pipes together looking like a spider web or spokes of a wheel. Into each of these is cut a venturi so that the gas inspirates the air in the proper proportions for complete combustion.

The other Van Stone furnaces are similar but smaller. The smallest is fired with four gas burners welded to a manifold of 2-in. pipe bent into a circle. The venturi for these burners is cut into the gas supply line to the manifold.

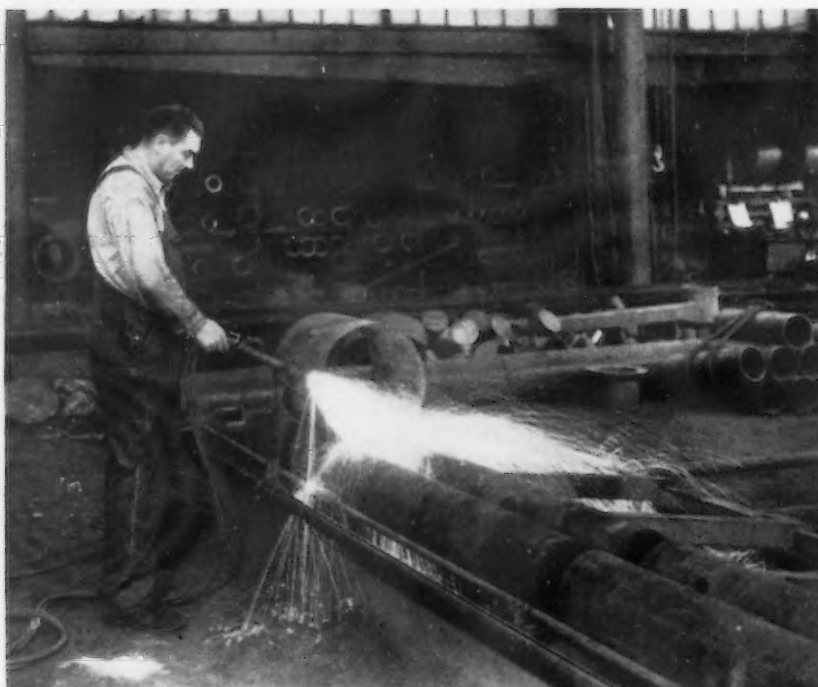
These furnaces, when needed, are placed by crane on a concrete base in front of the Van Stone machine. Although any length as well as size of pipe can be flanged in this unit, 40 ft. is generally the limit called for. When the end is



REAR view of pipe end heating furnace, showing circular gas manifold and venturi.



GAS-FIRED furnace for heating pipe for bending. Note counterweighted roof sections which act as doors through which the furnace is loaded and unloaded.



Automatic pipe cutting machine using gas torch for cutting.

up to forging heat, the pipe is clamped in a rack with the hot end in the flanger. The die of this machine is rotated by motor and wobbled by an eccentric and thrust forward, while flanging, by the pressure of an oil cylinder; from 800 to 1000 lb. pressure per sq. in. being required. The face and edges of the flanges or lap are then turned in a lathe.

Another metallurgical process of importance here is heating pipe for

bending. This is accomplished in a furnace designed to give flexibility as to size so as to accommodate any length of pipe. The center and permanent portion of this brick furnace is 15 ft. long, 3 ft. high and 6 ft. wide and contains both a combustion chamber and a heating chamber. Brick masons increase the length of this furnace by building sections on to each or both ends when desired, but the cross-sectional design and dimen-

sions remain unchanged. The top is a removable arch, as the heavy pipe is put in through this opening by crane. Two movable cast iron frames filled with firebrick work are swung into position to form the ends of this furnace.

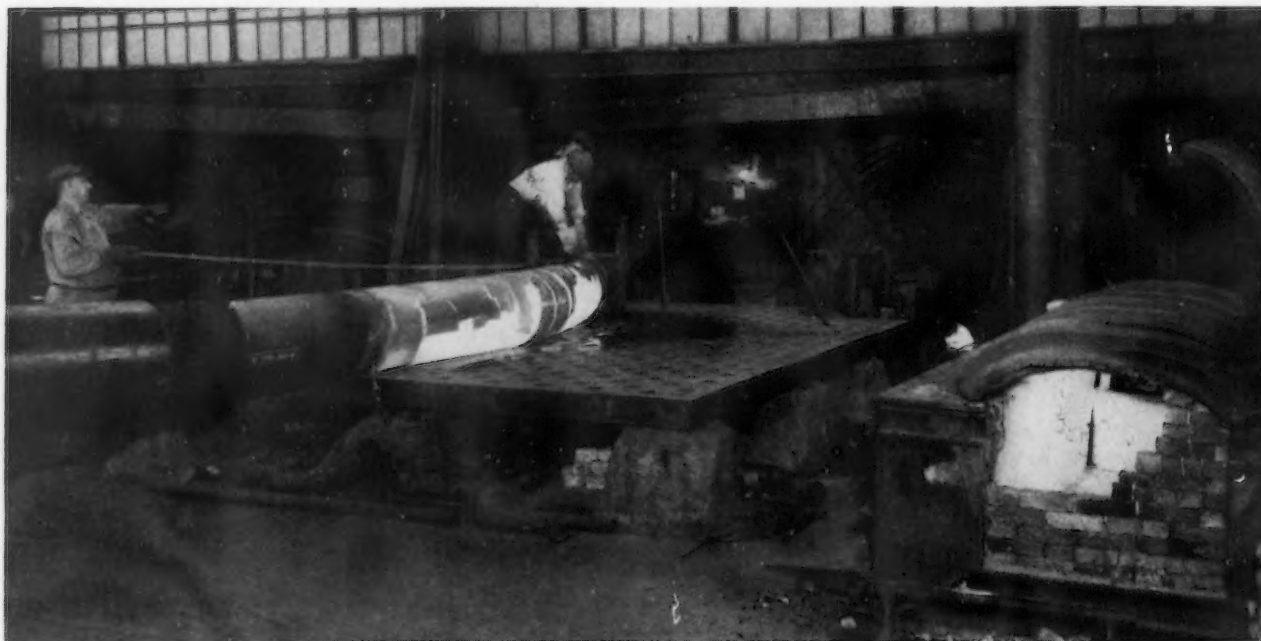
The roof or arch of the permanent portion of this furnace is made up of 11 sections, each section consisting of a cast iron arc holding an arc of firebrick. These cast iron segments are hinged at the back to a rod that lays in cast iron saddles placed on the top of the back wall of the furnace. These segments are easily tipped back by means of levers and counterbalancing weights.

Heat is supplied through 13 gas burners set in the back wall, close to the bottom and manifolded to a single venturi through a 3-in. manifold and 1-in. pipe take-offs. A bridge wall runs through the center of the furnace, the gas burners firing into the first chamber and the hot products of combustion rising over the bridge wall into the heating chamber.

A cast iron bending table and motor-driven capstan complete the unit.

Other equipment in this plant includes threading machines, large and small lathes, drill presses, grinders, welding apparatus, coiling machines, etc. Pipe up to 24 in. in diameter can be threaded here and there are facilities for

(CONCLUDED ON PAGE 95)



Bending hot pipe on a bending table.





# Bureau of Mines to Make Iron and Steel Scrap Survey\*

By DR. R. J. LUND

*United States Bureau of Mines,  
Washington*

WHILE the composite tonnage of scrap going into the production of secondary copper, lead, zinc, tin, aluminum, antimony, and nickel is very large indeed, it is of the order of magnitude of only a few per cent of the millions of tons of ferrous scrap which annually are consumed in the production of iron and steel. The vital importance of this ferrous scrap to our great iron and steel industry is generally recognized. According to careful estimates of C. H. Strand of Washington, total domestic consumption of scrap iron and scrap steel during the decade 1925-1934 inclusive was some 256,000,000 gross tons, of which about 193,000,000 tons was

consumed in steel manufacture. Our iron ore production during the same period amounted to 399,000,000 gross tons, with an average iron content of about 50 per cent, or roughly 200,000,000 tons. For rough comparison the exceedingly minor proportion of non-ferrous content of scrap consumed is neglected. The iron content of total scrap consumed during the period, therefore, was about 128 per cent of the iron content of ore produced, while the proportion of scrap used in steel manufacture almost equaled the iron content of the ore production.

These estimates on scrap consumption include sizable quantities of "home" or "plant" scrap, which might very roughly be estimated at around 50 per cent of the total. Purchased scrap consumed during the years 1925-34 would in all probability be well over 100,000,000 tons, or better than 50 per cent of the iron content of our iron ore output. Since the average annual ore production during this decade was 40,000,000 tons having an iron content of 20,000,000 tons,

the use of purchased scrap has extended the life of our iron ore reserves roughly five years during the 10 years under review. The time when our high-grade Lake ores will have been largely depleted, therefore, has been very considerably extended by the use of scrap in the manufacture of iron and steel.

Furthermore, such postponement of the time when certain ore bodies will be drawn upon has a marked effect in tending to decrease the present value of the ore already blocked out in the ground. Comprehensive valuation studies on ore reserves for tax purposes must therefore necessarily include careful consideration of the past and probable future consumption of scrap metal in relation to the total demand for such metal. Only in this way can a reasonable estimate be made of the amount of ore which will have to be drawn upon over a given period of years.

## Importance To Conservation

It has been pointed out frequently that production of miner-

\*Abstract of an address before the Institute of Scrap Iron and Steel, Chicago, Jan. 23.

als is a one-crop proposition. Nature has been busy over millions and millions of years to give us the limited quantity of minerals sufficiently concentrated for commercial development and near enough to the surface to be found and mined profitably. Although geologic processes will continue to replenish these reserves near the surface in the future, such replenishment may not occur and be made available to whatever form of life may then inhabit the earth for some tens or hundreds of millions of years. It is important, therefore, to treat present commercial deposits with care and derive the maximum benefit from their development and use. This, very briefly, is what is meant by conservation. As the function of carefully collecting, classifying, preparing, and utilizing scrap metals prolongs the life of ore reserves and assures larger future supplies, the task is clearly in the interest of conservation.

#### Statistics on Scrap Meager

The thought that metals produced from scrap, or its somewhat cruder synonym "junk," were inferior to primary or virgin metal has largely disappeared, due in the main to the tremendous strides made by the scrap industry along the lines of properly preparing, classifying, and sorting the scrap and to the great advances made by metallurgists in the technique of reshaping, remelting, or re-refining it. Even so, "the memory lingers on," as strikingly evidenced by the bill introduced in the State Senate of California last year to prohibit the use of scrap iron or any other scrap in any material used in the construction or repair of any public buildings, bridges, or other structures in that state. It is to be regretted that such misconceptions regarding quality still persist. The industry, which has been built around the collection, preparation, and marketing of these scrap metals, has developed rapidly into a powerful trade employing some 200,000 workers, doing an annual business probably running well over the hundred-million-dollar-mark, and finally commanding and receiving the recognition and respect of all legitimate business which is justly deserved.

In spite of its vital importance as an industrial raw material, the

actual statistical record of consumption of ferrous scrap is indeed meager and faltering. The Bureau of the Census covered this item in its 1929 canvass, and the Research Bureau of the scrap institute conducted a similar survey of scrap consumption the same year. This is the only year for which reasonably reliable figures are available.

Quarterly and annual statistics of revenue shipments of scrap iron and scrap steel by Class I steam railroads, compiled and released by the Interstate Commerce Commission, give some indication of scrap consumption. However, unknown additional quantities going into consumption tend to distort the picture and prevent use of these carefully compiled figures as an accurate gage of total ferrous scrap consumption. Outstanding among these indeterminables are the quantities of non-revenue scrap produced and shipped by the railroads direct to the consumers, and the amounts of scrap shipped solely by water.

Another means, used repeatedly in the past, of arriving at a rough approximation of ferrous scrap consumption might be termed the method of subtraction. By this method the amount of steel-making pig iron produced is subtracted from the production of steel ingot, with corrections made for average iron content of each, loss in slag, etc. Figures obtained in this way cover mainly the scrap consumed in open-hearth furnaces, and include the purely "home" or "plant" scrap as well as that purchased. More calculations can be made to obtain very rough estimates of scrap consumed in blast furnaces, foundries, rail rerolling mills, and other miscellaneous uses; but all these methods are based on assumptions concerning average plant practices which are conjectural to say the least.

#### Bureau To Make Survey

Recognizing the vital need for annual statistics of ferrous scrap consumption, and after repeated requests for such a service from industry and various agencies interested in the planning of future iron ore production and in more general economic analysis, the Bureau of Mines has been persuaded to make such an annual canvass beginning this year.

The bottle neck in the flow of ferrous scrap is undoubtedly at the door of the consumer. For this reason the Bureau is starting out by canvassing only the steel mills, blast furnaces, bar rolling mills, and foundries—no mean task, to be sure, in itself. Furthermore, the initial inquiry will be as simple as possible, requesting only the total consumption of scrap iron and scrap steel, broken down to show how much consisted of "home" or "plant" scrap, and how much was purchased, including under the latter category that returned under exchange contracts or conversion agreements, and also that transferred from other plants under the same control. A further breakdown is intended to show the quantity of "home" and purchased scrap, and how much pig iron was consumed by different types of equipment, such as blast furnaces, open-hearth furnaces, Bessemer converters, electric furnaces, cupolas, and air furnaces. Only totals will be published, and the confidence of individual returns will be respected. By keeping the inquiry simple, it is hoped that consumers will submit complete returns. No attempt will be made to cover the amount of scrap consumed in purely reshaping operations, since to include this relatively minor amount would involve difficult ramifications incommensurate with the value of the returns.

It is realized fully that information to be gained as a result of this survey literally will only scratch the surface of the tremendous store of statistically unknown data concerning ferrous scrap. It is felt, however, that annual figures on total consumption probably constitute the most important element on which to focus attention as a starting point. Other significant elements in the picture to which careful consideration has been given in studying the problems surrounding ferrous scrap as a vitally important industrial raw material can be briefly outlined as follows.

#### Problems of Study

Outstanding among the unknowns of ferrous scrap consumption is the ratio between the amount of "new" scrap and the amount of "old" scrap consumed. The term "new" scrap refers to material such as runners, skulls, risers, croppings, clippings, mill



scale, flashings, turnings, etc., which is discarded during the smelting of metal and during the manufacture of fabricated products from it. Material of this nature really comprises only a normal increment in the working stock of metal which the manufacturer requires. The term "old" scrap refers, in turn, to metal products which have already gone through a cycle of use and been discarded because of wear or obsolescence. No doubt the great preponderance of "home" scrap consumed by a large steel plant, let us say, consists of new material, although there is unquestionably a lot of worn out equipment in the plant which from time to time is utilized as part of the charge in its furnaces. Purchased scrap consists of huge tonnages of both new and old material—just what the ratio is we do not know and may never know. The significance attaching to this phase of the problem, however, is sufficient to urge a concerted attack in clarifying it.

Somewhat allied to the consideration of "old" and "new" scrap is the matter of industrial source of the ferrous scrap consumed. In other words, roughly what proportion comes from railroads, from automobile manufacturing and wrecking, from shipbreaking, from structural wrecking, from machinery manufacturing, from miscellaneous metal goods manufacturing, and from the home and farm? Rough estimates of proportions of consumption produced by certain industries have been made in the past.

Until recently, apparently the railroads were far out in front as producers of scrap iron and steel, in which case undoubtedly the great preponderance could be classified as old material. In the last few years, however, it appears that the automobile industry has displaced the railroads as the most important supplier of ferrous scrap, a large proportion of which is lighter, new material. The consumer might be able to tell us a little about this phase of the problem; but no doubt your industry which collects, sorts, classifies, and markets the material is the best source of data of this character. Dealers can give no information, of course, concerning the nature of the quantities of material, apparently increasing, which go direct from the producer to the con-

sumer. However, a statistical analysis, rough though it may be, of the industrial source of ferrous scrap going through dealers would be highly significant.

#### Further Breakdown Later

This year the Bureau of Mines is gathering data only for total scrap iron and scrap steel. It would be extremely pertinent to extend this to include not only how much of this consisted of scrap iron and how much of scrap steel, but also to inquire as to how much consisted of the various classes of scrap iron and of scrap steel. Needless to say, if and when statistical studies on ferrous scrap are extended to include such a classification, it necessarily will have to be a relatively simple one, and not include each of the multitude of classes already recognized and used commercially in the trade. The increasing relative importance of light rolled steel such as sheet and strip in comparison with heavier products, as well as the tendency to use greater proportions of special alloy steels seemingly already is tending to bring about somewhat of a scarcity of heavy-melting in the market. In the future this situation will no doubt be aggravated rather than mitigated if this trend continues, and will probably necessitate certain changes in technique of preparing and utilizing the increasing proportions of this class of material.

#### Geographic Flow To Be Considered

Another important feature in the study of scrap iron and scrap steel is its geographic flow. In other words, where does it originate and what courses does it follow to its ultimate points of consumption? The survey should show the general character of the geography of scrap consumption; but there remains the very important features of geographic origin of this material. This will be difficult to trace. The very careful figures of the Interstate Commerce Commission on revenue shipments of scrap iron and scrap steel tell considerable concerning the geographic flow, since they show tonnage originating and tonnage terminating along the lines of the various railroads in each of the districts and regions into which the United States is subdivided by

them. More detail as to this flow, however, would be highly instructive and useful.

No doubt a breakdown of the figures to show how much of the purchased scrap consumed came direct from the producer and how much came through dealers' hands would be of vital interest. Apparently there is a growing tendency for the large producer to sort and classify more and more of his own material and sell it direct to the consumer, which trend naturally causes grave concern to the scrap industry. This, however, is another feature to be tackled statistically in the future.

Even though the present survey does not include canvassing dealers for information, the results will doubtless be of value to the trade as well as to other groups interested in various aspects of ferrous scrap. If the trade strongly requests that additional details be built around the skeletonized and fundamental data sought this year, such as estimates of the amount of old and new scrap going through the market, industrial source of the scrap, its geographic flow, a simple classification into commercial grades, or figures throwing light on the direct dealing question, the Bureau will give serious consideration to the matter of expanding the survey to include those details in greatest demand. When these additional data are sought, most of which can best be furnished by dealers, their cooperation and support will be needed in supplying the information.

The Planning Committee on Mineral Policy, in the report of the National Resources Board of December, 1934, summed up discussion on scrap metals by the very succinct statement: "The subject of scrap is the great blind spot of the world's metal economy." The Bureau is sure that dealers are in agreement with this view and with the further point that the most vital initial step to be taken to improve the situation is inauguration of this annual survey on ferrous scrap consumption. In spite of a very small appropriation that greatly limits new activities, the Bureau of Mines could no longer avoid the responsibility for at least preliminary exploration of the field of ferrous scrap to see what basic facts were most urgently needed and desired.





# Improvements in Production

## Tool and Holder Design Provide Guided Adjustment and Full Support

A NEW line of turning tools, designated as "Mitco Pin Splice," has been announced by the Michigan Tool Co., Detroit. Guide pins are employed to locate the tool in the holder. Both tool and holder are supplied with small diameter semi-cylindrical grooves parallel to a line tangent to the work piece at the point of tool contact. Dowels or splice pins fit into these grooves and are fixed in the holder, so that the tool can be shifted up and down in the holder, using the pins as guides. When located, clamping is by tightening the clamps of the split holder. Below a simple splice

forming-tool is shown, illustrating the method of clamping, the manner in which filler blocks are employed to replace portions of the tool worn out in service. It also illustrates use in simple forms of lathe tool holders. Below is shown a complete pin splice tooling set-up for an automatic lathe for rough and finish turning, cheeking and forming, of a rear crankshaft bearing, together with the crankshaft flange. The tool block at the left mounts on the back side of the lathe. At the right in the foreground are filler blocks for use when tools have been worn down in service. For circular forming,

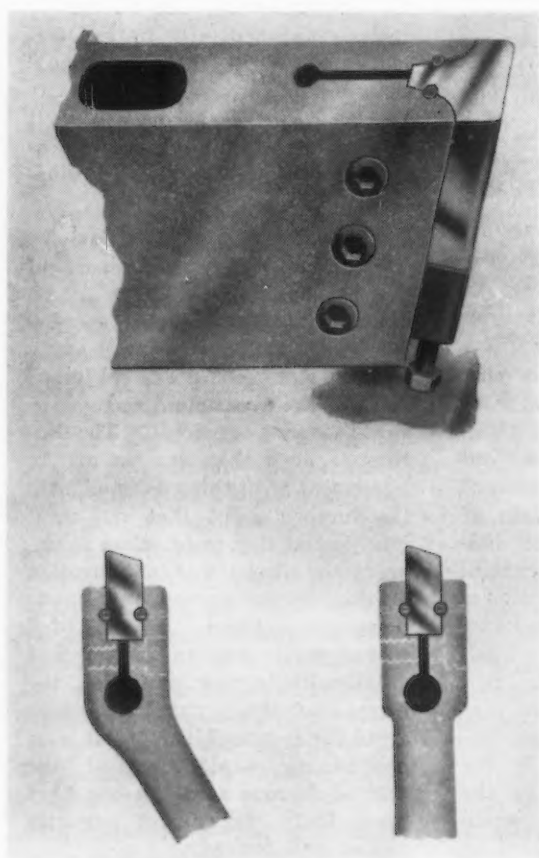
an unusual degree of support is given the cutting edge.

## Shipping Room Stand Of Convenient Design

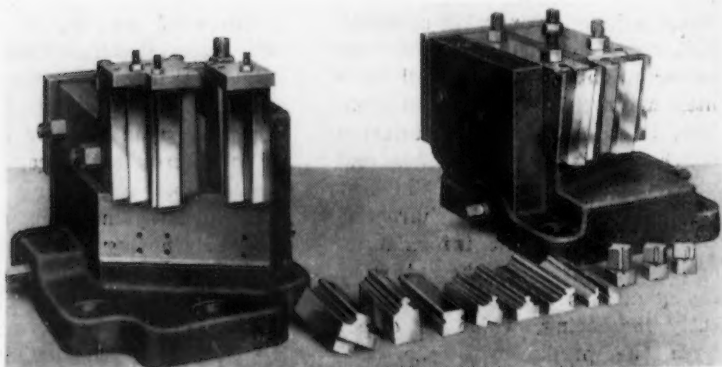
AN all-steel reel stand, light in weight, and of electric welded angle iron construction, is marketed by the Steel Strapping Division of the Stanley Works, New Britain, Conn. An automatic brake is applied immediately upon discontinuance of pulling action, thus preventing backlash. The stand is equipped with a box for seals and has provisions at either end for hanging hooks.

## New Line Wide Swing Polishing Lathes

HAMMOND MACHINERY BUILDERS, INC., Kalamazoo, Mich., have announced a line of polishing lathes specially designed for automobile fenders and similar work requiring a wide swing. The design includes two independent spindles, each driven through V-belt by individual motor mounted in the base. Three sizes are built with distances from base to inside of wheel up to 30 in. Belts are replaced without disturbing spindle or motor mountings.



The elimination of sharp corners, common to dovetail design, is provided for in a new line of tools and holders illustrated at left and below.





## Hydraulic Press Design Substitutes Steel Slab Members for Tie Rods

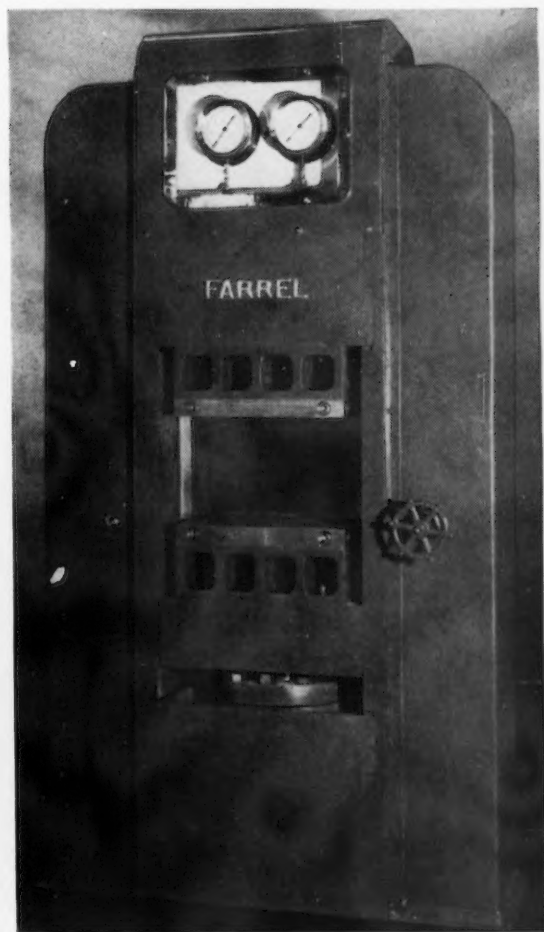
ONE HUNDRED tons is the rated capacity of a new hydraulic press designed especially for plastics and rubber molding operations, as announced by Farrel-Birmingham Co., Inc., Ansonia, Conn. A self-contained hydraulic power unit utilizes oil as the fluid medium. The machine has platens 20 in. sq., with an opening of 12 in. between. Tie rods, between the top and bottom crosshead are dispensed with and, instead, steel slabs are employed as tension members. These are

finished to fit machined tongues which project from the top and bottom crossheads and have adjustment by means of patented tapered keys.

The bottom crosshead is integral with the cylinder, which contains the hardened and polished ram. Interposed between the steam platens and the crossheads are ventilated grids for lessening heat transfer. Suitable clearance for the upper and lower steam connections is provided in the slab tension members.

A variable displacement pump, with its driving motor, is mounted on a steel bedplate over the top crosshead, which also serves as an oil reservoir. Steam and oil pressure gages are mounted in a white enameled depression on the front face of the top crosshead, behind a shatter-proof glass, and are illuminated by indirect lighting.

The operation of the press requires the opening or closing of but one valve. Maximum pressure adjustment of the variable displacement pump is made by a single turn of the pump control handwheel. The adjustment requires no attention after it is set for the correct value for any particular operations. Press utility is not limited to the working of plastics and rubber molding. As to appearance the machine is modernly cleanlined.



### AT LEFT

A striking illustration of the trend in clean-line design, in the interest of appearance, is afforded by a new hydraulic press.

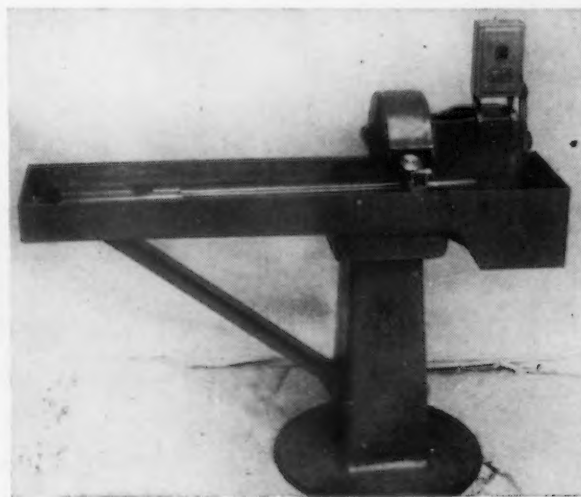
o o o

### BELOW

Work pieces are totally submerged in coolant for disk cut-off operations, using thin abrasive wheels.

## Disk Cut-off Machine For Submerged Work

CUTTING through shaped bars, rods or tubes of hard glass, ceramics, metals and similar materials up to 2½ in. in diameter is said to be a matter of few seconds with a new wet-disk



cutter by the Eisler Engineering Co., 769 South 13th Street, Newark, N. J.

The cutting tool consists of a thin abrasive wheel driven by a  $\frac{3}{4}$ -hp. motor at a speed of 5500 surface ft. per min. The wheel revolves within a cooling tank partially filled with water to above the cutting level. An adjustable stop is furnished for accurately determining the correct cutting length. A quick acting clamp and long trough facilitate holding and handling the material.

As the cutting takes place under water, dust hazard is eliminated and burning of material avoided.

## New Power Take-off For Job Welding

**J**OB WELDERS, pipe line contractors, steel erectors, repair shops and other arc welding users to whom portable welding equipment is a necessity can now install an arc welding generator on any standard  $1\frac{1}{2}$ -ton truck and drive the welder direct from the truck motor. This result is obtained through a power take-off developed by the Hercules Steel Products Co., Galion, Ohio, in conjunction with the Lincoln Electric Co., Cleveland.

The power take-off is built in various models to operate as a direct drive or from the side. The unit is adaptable to all makes and models of trucks.

Power supplied by the truck motor is sufficient to drive either a 200 or a 300 amp. welding generator. Control may be from the driver's seat by a single lever. While welding, the speed of the truck motor is controlled by a fly-ball type mechanical governor.

## Pipe Threading and "Bucking-up" Equipment for Tool Joint Threads

**L**ANDIS MACHINE CO., Waynesboro, Pa., has announced a new equipment, incorporating a dual speed range on Landis threading and cutting machines, for use in threading and pulling joints tight on drill pipe. The latter operation is commonly referred to as "bucking-up" the joints. A receding chaser die head is employed. Two motors are used; one at 1200 r.p.m. for threading, provides spindle speeds through the gear box, ranging from 8 to 28 r.p.m. for thread cutting. The second 1200

r.p.m. motor with geared head for 260 r.p.m., supplies a spindle speed of 2 r.p.m. for the "bucking-up" operation. For driving at threading speeds, a friction clutch is employed, whereas a tooth clutch is used for the slow speed. The motors do not operate simultaneously and each is equipped with an individual clutch lever. Three station push buttons control; (1) starts the threading motor; (2) starts the slow speed motor; (3) stops the machine.

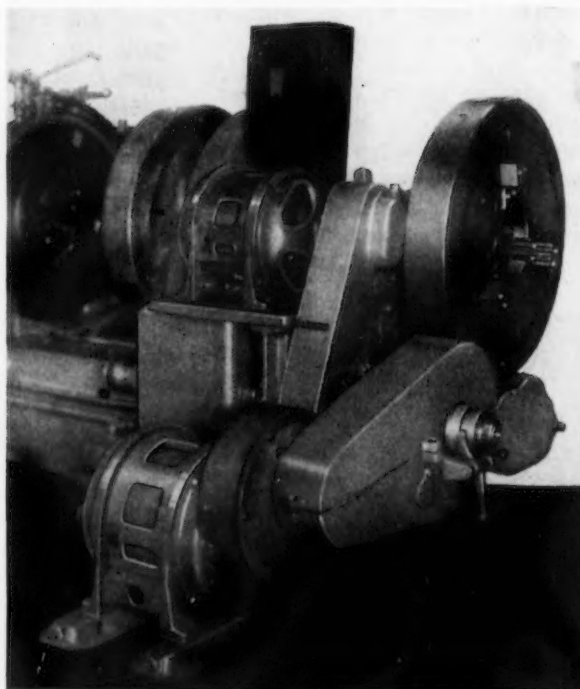
### AT RIGHT

Two speeds are employed in combination equipment for threading and "bucking-up" tool joint threads.

o o o

### BELOW

Illustrating combined transportation of, and power source for, job welding equipment, utilizing any make of  $1\frac{1}{2}$ -ton truck.







## Huge Fractionating Equipment

**A** RECORD size fractionating column, built and moved in one piece, was recently shipped by the A. O. Smith Corp., Milwaukee, to the Atlantic seaboard over The Milwaukee Road and the Erie Railroad. This unit, which is 94 ft. long by 13 ft. diameter, required three standard flat cars in shipment. It was designed by the Universal Oil Products Co., Chicago, and was delivered to the Asiatic

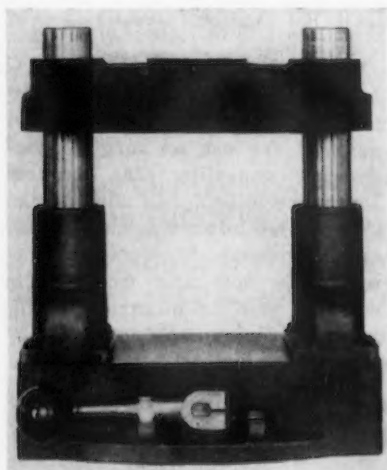
Petroleum Co. for shipment to the Dutch West Indies.

A striking operation in connection with fabrication was the manner and speed with which the entire interior, including tray angles, baffles, boxes and standpipes, a total of 6000 sq. ft. was grit-blasted, and metallized with 0.018 in. of aluminum, in a total lapsed time of 140 hr.

This metallizing work was per-

formed by Metallizing, Inc., Chicago.

Three sand blast machines, using angular steel grit, and six metallizing units, were in constant operation for the entire 140-hr. period. A crew of 32 men worked in shifts 24 hr. per day. The column was bulkheaded so that sand blasting and metallizing could proceed at the same time. More than 1300 lb. of aluminum were applied.

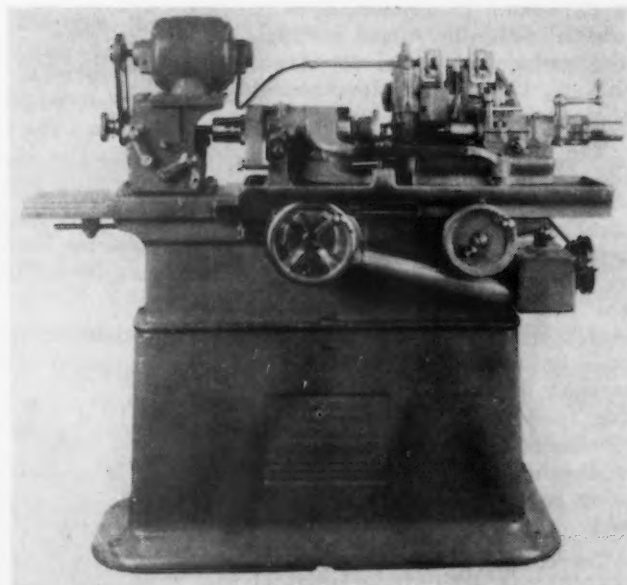


ABOVE

A new arrangement of eccentric gears locking mechanism under each guide post is said to increase work-holding pressures without increasing pressure required for jig operation, in an improved compact drill jig announced by Esco Engineering Co., 1922 Linwood Avenue, Toledo, Ohio.

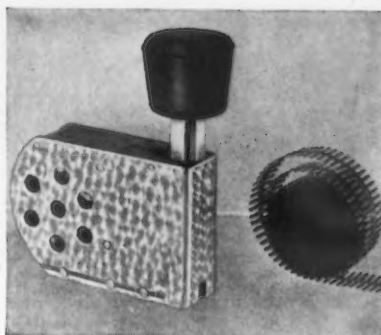
AT RIGHT

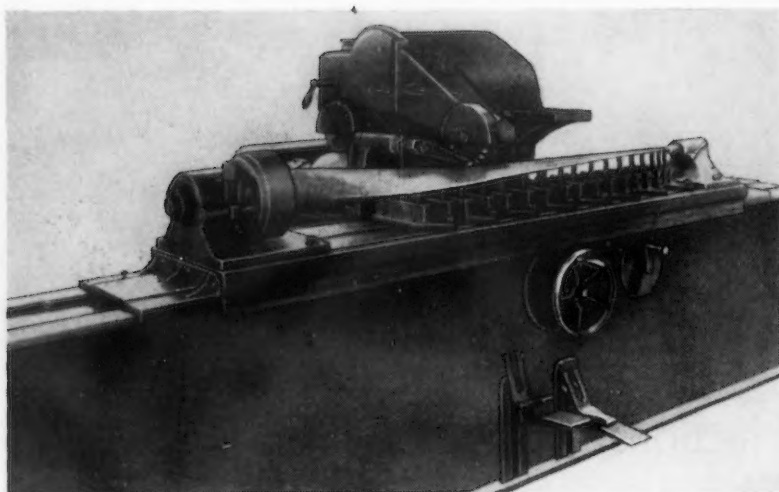
A new high-speed, heavy-duty machine for turning and grinding pistons is announced by Van Norman Machine Tool Co., Springfield, Mass.



AT LEFT

A vest pocket size stapler for use in attaching tags and papers to shipments employs a magazine attachment carrying 1000 staples which are driven by a light blow on a driving ram. The device is manufactured by Paslode Co., Merchandise Mart, Chicago, Ill.





## Airplane Propeller Profiler

THE airplane propeller profiler illustrated, is a result of four years' research and experimentation participated in by the Engineering & Research Corp., 6100 Sligo Mill Road, N. E., Washington, D. C., and the Hamilton Standard Propeller Co., East Hartford, Conn., in connection with original design by James Lee Simmons who had early experience back to 1910 in the development of wooden propellers.

The illustrated design profiles one side of a propeller blade at a time. The master cam is solid cast iron, with length of about two in. greater than the maximum width of the blade being produced. The cam rotates and is directly geared and synchronized with the table on which the blade is fed horizontally past the cutter. Each line radially on the master cam represents a corresponding element of the blade; a separate master being required for each face and back.

The cutter, with roller of similar profile, reciprocates forward and back in simple harmonic motion and oscillates freely about a trunnion which permits the vertical travel necessary to the contour.

The propeller blade, adjustably supported as illustrated, is fed horizontally past the cutter from tip to hub. A weighted roller precedes the cutter. At about 18 in. from the hub, the cutter lifts and the machine is automatically stopped. The table is then hand-cranked back for reloading. Push

button switch control is utilized in cutting.

The cutter is of special design and has a peripheral speed of approximately 5000 ft. per min. It is practical to remove  $\frac{3}{8}$  in. of metal with a single cut.

The length of stroke may be varied, as well as its position altered, in relation to the center line of the table. The number of strokes per min. is determined by pulley size. The rate of horizontal feed may be changed while the machine is in operation.

Micrometer adjustments provide that the blade center of gravity may be shifted in four directions.

In producing the cam the cutter

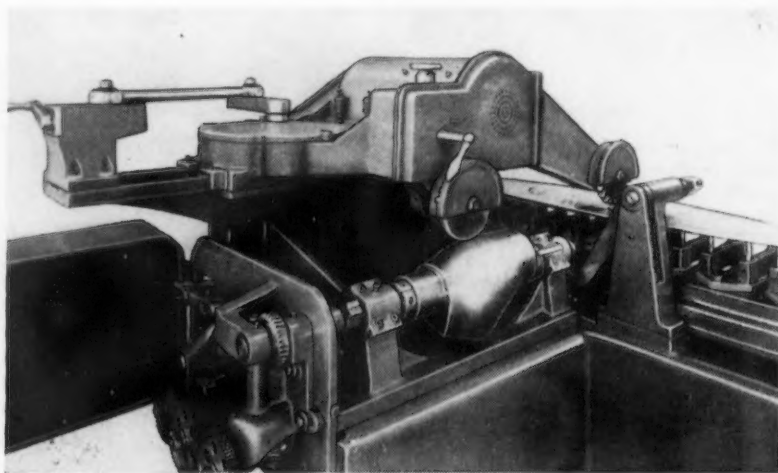
and roller positions are reversed. A hand finished master blade is mounted on the table and a wooden fairing is worked around it so that the roll may travel approximately one in. past the leading and trailing edges of the master blade. A wooden block, mounted on the master cam shaft, is used for pattern material. The cast iron master cam from the pattern is ground with a similar set-up.

The blade of a 10-ft. propeller is said to be machined to the 18-in. station in one hr., with one cut. About  $\frac{1}{2}$  hr. hand work is required on the machined surface and leading and trailing edges. An accuracy of 0.002-0.003 is maintained, and simplifies balancing operation and interchangeability. The blade in the illustrated set-up is of a 13-ft. propeller.

The machine base is of welded steel box type, with bulkheads and bottom and was fabricated by Lukenweld Co., Coatesville, Pa.

## Duplicating Valve for Burner Operation

AN oil regulating valve, type G, by the Mahr Mfg. Co., Minneapolis, Minn., has been announced for use on forging, heat treating, annealing, etc., furnaces. The valve is equipped with a scale and pointer to provide that burner operation may be duplicated on repeat or periodic work. The valve is said to eliminate fading or gradual flame reduction.



The master cam is a solid piece of cast iron. Each cam line radially represents a corresponding element of the blade.



G. L. LACHER

## An Announcement

• • •



T. H. GERKEN

ON Feb. 1, Gilbert L. Lacher, managing editor of THE IRON AGE for the past five years, became identified with the United States Steel Corp'n. and will serve that company in its New York headquarters.

Mr. Lacher was graduated from the University of Wisconsin in 1914, having majored in economics. After a brief experience with a weekly newspaper, he joined the editorial staff of *Railway Age* at Chicago, remaining with that organization until February, 1919, when he was appointed Western editor of THE IRON AGE, with headquarters in Chicago. In August, 1925, he was transferred to the main office at New York as associate editor. He became managing editor in April, 1930.

During his service with this organization Mr. Lacher made an enviable reputation with our readers and with his associates for keen insight into the industry's problems and for scholarly discussion of them in our columns. We mark his going with regret but wish him the utmost success in his new opportunities.

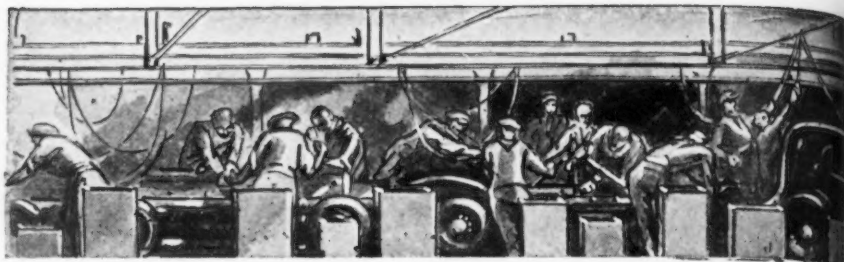
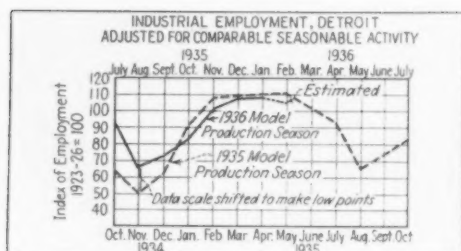
T. H. GERKEN, who becomes managing editor of THE IRON AGE, was graduated from Northwestern University in 1926, after completing the course in journalism. His college career was interrupted for one year, during which time he gained practical newspaper experience through editing the *Jackson Herald*. In addition, during summer vacations, Mr. Gerken worked successively as deck-hand on Great Lakes ore freighters, as yard clerk for the D. T. & I. Railroad at Jackson, Ohio, and as a surveyor for the Ohio State Highway Department.

Mr. Gerken's entire business career, since graduation, has been with THE IRON AGE. After three years in the New York office he was sent to Pittsburgh to become resident editor, working in that capacity until September, 1933, when he was recalled to New York to become news editor.

Mr. Gerken has demonstrated unusual capacity for the effective coordination of the multiple activities that are encountered in the editorial conduct of a large weekly publication, such as THE IRON AGE. In addition, he is widely known in our industry. We know that you will join with us in best wishes for success in his new responsibilities.

J. H. VAN DEVENTER,  
Editor, THE IRON AGE.





## THIS WEEK ON THE

# Medium Price Cars Stage a Comeback

FEBRUARY 3, 1936.

THE day for the medium priced car seems to be definitely at hand. All through the depression, cars in the lower price brackets were the only ones that seemed to have a market at all, and as a result we saw tremendous advances in quality made in the face of a practically stationary price. Experience this winter is proving that in the noble experiment of fall introductions of models, cars in the thousand dollar class are maintaining schedules at a more even level than are the volume sellers. Ford is the exception, in that the volume of V-8 production has hung around the 5000 mark for months. Chevrolet has been trimming schedules in recent weeks, and Plymouth has steadily cut its work week. First, it cut from six to five days, then from five to four, and now we learn that the plant will operate only on Tuesday and Wednesday of this week.

Buick, on the other hand, is going right along. Daily production is currently 700 units, down slightly from the reputed 800-a-day capacity. Packard is producing 300 cars a day, mostly 120's, and will probably increase the work week from four days in January to five days in February. Studebaker is also maintaining schedules. Buick's position is explained by figures released on domestic retail deliveries during the second ten days of January, which showed an increase of 497 over the first ten days to 2374 units. This would indicate a rising market after the lull in buying following the holidays. Graham-Paige

also showed a spurt in retail sales during the same period.

Yet, despite these optimistic factors, total production in the industry declines from week to week, and none of the car builders seem willing to put a date on the expected upturn due to spring buying. At least, commitments for steel and other semi-finished materials give no such indication on a broad scale. There have been no large orders placed, for example, for delivery four to six weeks hence. On the other hand, there have been holdups in deliveries scheduled for current consumption. The local steel sellers are glum and refer to this period as the doldrums.

There are many factors in the wind that indicate an active market for automobiles as soon as winter loosens its grip on the northern half of the country. Certainly, the used car situation has received all the attention it deserves and is being ameliorated to a certain extent. There seems to be more advertising going on over the "air" in the favor of used cars than for new ones.

Detroit's used car problem is one all its own. There are practically no "Jollopies" seen on the used car lots. Instead there are a surprisingly large number of late models, '34's and '35's in large proportion. Explanation is that most Detroit business men, who all commute by private car, abandoned their expensive cars during the early 'thirties and bought Fords, Chevrolets and Plymouths. They drive them a year and turn them in for the next year's model. The trade-ins are in excellent condition and

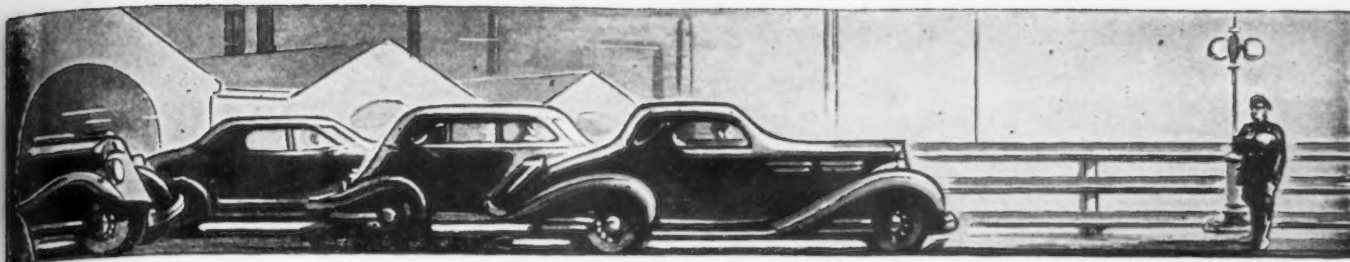
command good prices—\$400 to \$450. Many of these cars have been factory reconditioned to enhance their value. As such, they constitute a real challenge to new car sales. The spurt in sales of cars in the thousand-dollar class would indicate that our prosperous business executive is going back into his proper equipage. It remains to be seen whether the great middle income class will take up the burden of absorbing the industry's volume output from now on. Many observers believe they will, and some confirmed optimists envision a 10-million-car year by 1940.

For the immediate present, we have the Bonus with us, and some cheerful veterans have already placed their orders for their new cars. This disbursement, as it filters through the channels of trade, will undoubtedly help boost spring buying of cars to new highs.

A backward glance at 1935 is given in the official registration figures of passenger cars in the United States as compiled by Polk. Up 45 per cent from 1934, the figure is 2,743,908 units, compared with 1,888,557 registered during 1934. During December, passenger car registrations were 237,194, the largest December in the history of the industry. Last December, the figure was 75,514. Truck and commercial car registrations are not complete, so that it is not yet possible to make comparisons between total production and registrations last year.

### Machine Buying in Offing

Machinery closures have been slow in the past week, but there



# ASSEMBLY LINE

By FRANK J. OLIVER

*Detroit Editor, The Iron Age*

is a large volume of business about to "break." A few machines have been purchased for Chrysler's apprentice school, and some inquiries are out for equipment for the Marysville plant. This factory, formerly occupied by Wills St. Claire, will be used as a service parts division, mostly on stampings. Machinery now installed at the Highland Park plant will be moved out, allowing more room for the present crowded service parts division. General Motors is re-opening its Brown-Lipe-Chapin plant in Syracuse, N. Y., and will manufacture headlamps there.

Murray Corp'n. is soon to acquire additional machinery for its expanded die shop facilities. The steel work is being erected now. Large milling machines and automatic die sinkers will be installed to handle the larger type of dies on the 1937 die building program. This program has already begun here, as at other plants, in anticipation of extensive changes in bodies. Where last year the die building program lasted barely three months, this year it is expected to continue for at least six months. Elimination of overtime will be largely accomplished, and employment stability will be more nearly achieved in a highly seasonal industry.

Movements afoot among General Motors' units point to further decentralization. The move to Grand Rapids is typical. Concentration of activities in two other cities outside of Detroit has been under way for some time. More and more of the Pontiac car is being made in Pontiac. The foundry was re-opened there recently, and now machinery is being installed to manufacture the rear axle. Much of this equipment came from the Chevrolet gear and axle plant in Detroit. An idle plant of GM has been reopened in Saginaw, and now combines a transmission plant and a forge (bumper) shop for Chevrolet components. In fact, about 2000 workers have been

added to the Saginaw payroll. Already there is a gray iron foundry, a malleable iron foundry, and a steering gear plant in that town. Bumpers also are made at the Detroit forge plant of Chevrolet.

In the face of these reports came the announcement of an addition to the Chevrolet power plant in Detroit, on which \$50,000 is to be spent. Two 7500-kva. generators are to be installed, together with the necessary turbines and other powerplant equipment.

## Labor Situation

Events are shaping their expected courses along the labor front. Chrysler is fighting the National Labor Relations Board by challenging the constitutionality of the labor disputes act. Through the Federal District Court, a restraining order has been obtained enjoining the board from holding an election to determine the strength of the Society of Designing Engineers as the sole bargaining agency for all Chrysler engineers. Same day and through the same court, General Motors obtained a restraining order on scheduled hearings on a discrimination complaint originating at the truck plant in Pontiac. Arguments on both cases will be heard this week.

As far as the general situation is concerned, the time is hardly ripe for any real test of organized labor's strength in the automotive industries. In fact, there is no strength. Nor will there be as long as minor independents fail to unite on any solid program and as long as the present national administration of the A. F. of L. continues to follow the craft unions' pattern. The recent bid by the A. F. of L. to members of the independents to come over and join the ranks as "individuals" was met only by sarcasm by the independent leaders. The only progressive step seems to have been the granting of autonomy to the United Automobile Workers, whose officers had until

now been merely appointees of the Federation's council.

John L. Lewis has been in Detroit to feel the situation out, and while he retired from the scene without saying much, it is probable Detroit shall see him again within the month. But any labor leader, no matter how good an orator, is going to have a hard time lining up this city's workers. There just doesn't seem to be any enthusiasm for this sort of thing. Either that or the spark of leadership is simply not there. Father Coughlin has been flirting with the local labor set-up for some time, but denies to date intentions of becoming an active participant in labor affairs.

On the other side of the picture, we have probably the strongest open shop community in the United States. Plants are enormous in size and in numbers of workers. Wages are good, and high standards of industrial relations prevail. It is an accepted fact that the combined action of the three largest employers in a shut-down for "inventory" for 30 days or so would put a crimp in any strong movement to organize the industry. Any one of the large manufacturers would shut up shop rather than submit to control and domination of organized labor. But there seems to be no fear of such a thing occurring this year, nor next.

## Apprentice Training Booms

Detroit's apprenticeship program goes on apace. Many of the automobile companies are already on the band-wagon. Hudson started with 25 boys, Murray Corp'n. has 36, Fisher Body will build up to 75, and Chrysler will have over a hundred boys in training for the skilled trades. In some plants the boys will be scattered through the regular shops, principally the tool and die rooms. At Chrysler, an apprentice shop is being equipped, and the boys will be under special supervision.



*The* POWER  
BEHIND THE PURCHASE  
*is a Power because of his Ability to Produce*



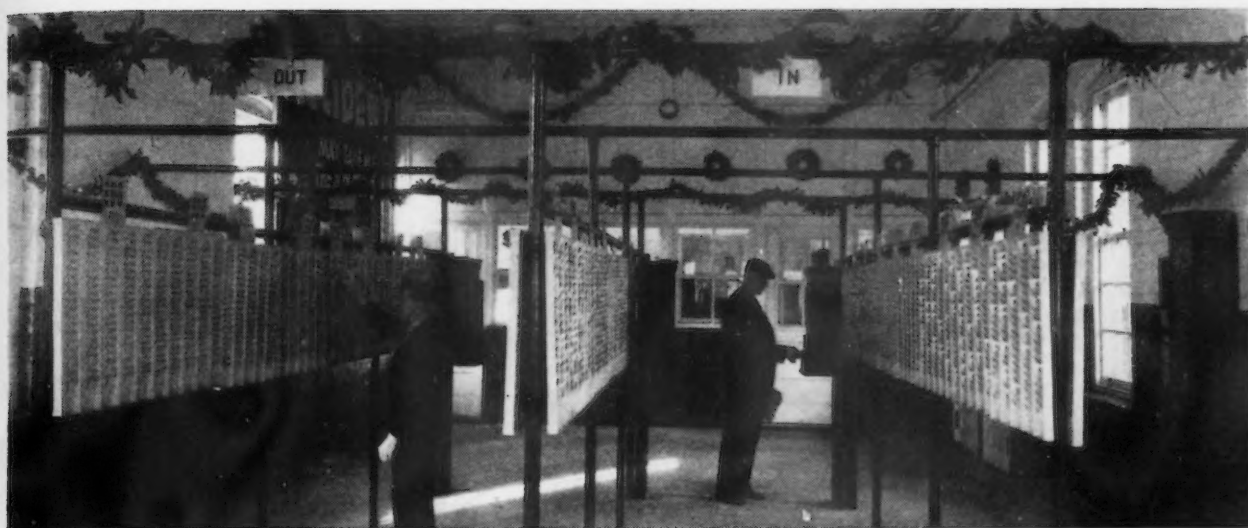
Selection of Equipment which has Ability to Produce is largely based on Confidence, Knowledge of Past Performance, or by Comparison.

Bullard Vertical Turret Lathes in 24—36—42 and 54 inch sizes meet the requirements of Careful and Practical buyers. We suggest that you Demand and Have Bullard Performance in your plant.

***Time Saved is Money Earned***

BRIDGEPORT    **THE BULLARD COMPANY**    CONNECTICUT





Through the clock room pass not only the 977 men assigned to lockers in the new welfare building but all employees of the Merchant Mills designated to use this entrance.

## Bethlehem Completes New Welfare Building

AS part of its improvement program during the past year Bethlehem Steel Co., Bethlehem, Pa., completed and placed in service one of the most modern welfare buildings of its kind.

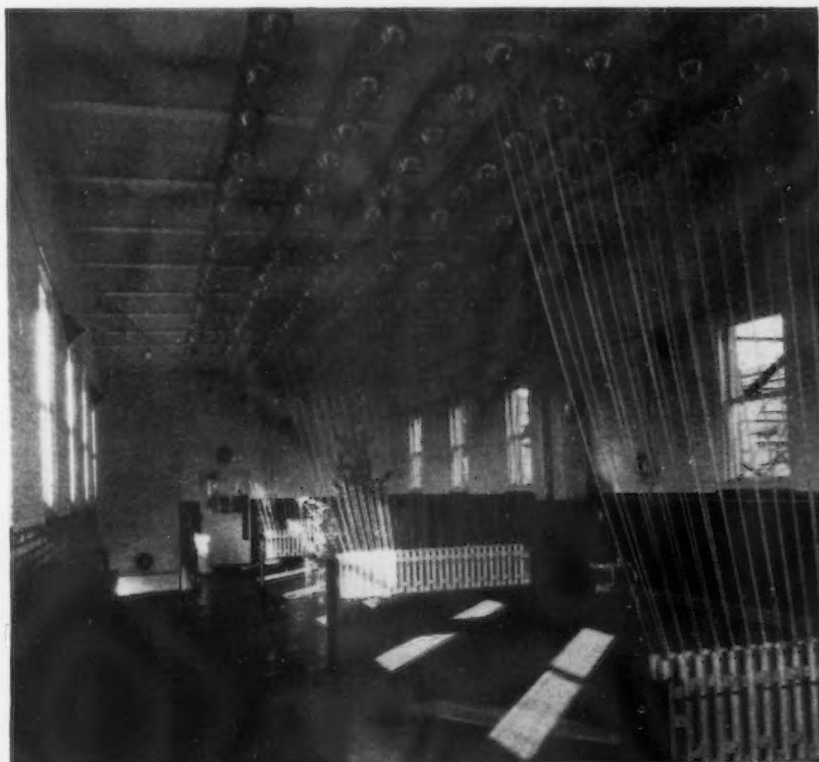
Built to accommodate 977 men in three-shift spreads, this two-story brick and steel-reinforced building encloses an area slightly in excess of a third of an acre, which is divided into three spacious rooms per floor. At the front of the building is the clock room through which these employees gain entrance to this section of the plant. Two other rooms on this floor are assigned to mill men, as they are designated, who, by the nature of their work dress differently than the men who are assigned to the upper floor. Because of the heavy shoes and other protective trappings they must wear, they are restricted from using the stairways as a safety measure within the building. These two rooms are each equipped with eight individual showers, two of the latest type 54-in. diameter wash fountains, and individual clothes baskets on chains suspended between ceiling pulleys and locking racks.

On the second floor the three rooms are used by men engaged in different classes of work. One is for chippers, one for grinders, and the other for maintenance men. In these three rooms there are 18 individual showers, five wash fountains, and the usual toilet facilities.

The purpose behind the divisions set up as described is to prevent confusion during a change of shifts so that the greatest number of men can be accommodated within the shortest period of time.

Steam heat is provided within the building and distributed through separate heat diffusers of a type that can be used in summer as air-conditioning units, simply by re-

(CONTINUED ON PAGE 92)



Spacious quarters for the welfare of workmen employed at the Merchant Mills, Lehigh Division, Bethlehem, Pa., plant of Bethlehem Steel Co. One of the five rooms as it appeared when first used during the past holiday season. To the right center is the type of heat-diffusing unit employed, which will function as an air-conditioning unit in summer.

# Exports in 1935 Were 12 Per Cent Ahead of 1934

Exports (In Gross Tons)	December		Twelve Months Ended December	
	1935	1934	1935	1934
Pig iron.....	1,066	976	4,107	4,096
Ferromanganese.....	...	51	131	195
Iron and steel scrap.....	142,135	196,361	2,047,290	1,835,554
Tin plate scrap <sup>2</sup> .....	2,673	...	38,597	...
Waste-waste tin plate.....	3,572	...	21,927	...
<i>Pig iron, ferroalloys and scrap.....</i>	<i>149,446</i>	<i>197,388</i>	<i>2,112,052</i>	<i>1,839,845</i>
Ingots, blooms, billets, sheet bars.....	732	1,679	39,782	19,586
Skelp.....	3,290	428	64,421	74,501
Wire rods.....	2,943	460	26,090	23,734
<i>Semi-finished steel.....</i>	<i>6,965</i>	<i>2,567</i>	<i>130,293</i>	<i>117,821</i>
Steel bars.....	3,478	5,538	52,289	42,964
Alloy steel bars.....	174	248	2,816	2,911
Iron bars.....	150	32	1,200	1,002
Plates, iron and steel.....	5,701	4,039	45,889	38,369
Sheets, galvanized steel.....	7,791	5,657	73,063	67,146
Sheets, galvanized iron.....	154	209	1,948	1,424
Sheets, black steel.....	7,671	9,471	100,483	90,995
Sheets, black iron.....	94	219	5,186	4,325
Hoops, bands, strip steel.....	3,401	3,528	44,655	29,284
Tin plate and taggers' tin.....	18,923	17,599	132,212	184,651
Terne plate (including long ternes) <sup>3</sup> .....	102	...	2,234	...
Structural shapes, plain material.....	4,079	2,417	36,656	33,011
Structural material, fabricated.....	1,019	2,456	19,812	21,596
Tanks, steel.....	2,025	1,016	8,704	7,875
Steel rails.....	7,120	8,102	51,671	69,159
Rail fastenings, switches, spikes, etc....	1,354	1,399	10,293	16,929
Boiler tubes.....	530	703	8,642	8,245
Casing and oil line pipe.....	1,857	3,912	26,445	59,782
Pipe, black and galvanized, welded steel	2,558	3,057	32,945	43,752
Pipe, black and galvanized, welded iron	374	305	3,349	2,407
Plain wire.....	3,177	2,821	39,063	36,520
Barbed wire and woven wire fencing...	3,411	2,763	34,143	37,449
Wire cloth and screening.....	103	66	1,041	965
Wire rope.....	259	149	4,039	2,682
Wire nails.....	1,055	1,017	11,136	13,201
Other nails and tacks.....	296	382	3,707	4,987
Other wire and manufactures.....	1,117	338	5,937	4,700
Bolts, nuts, rivets and washers, except track.....	481	533	6,370	5,091
Other finished steel.....	171	159	1,528	1,785
<i>Rolled and finished steel.....</i>	<i>78,625</i>	<i>78,135</i>	<i>767,156</i>	<i>833,207</i>
Cast iron pipe and fittings.....	511	2,145	17,512	17,703
Malleable iron screwed fittings.....	283	229	3,474	2,980
Car wheels and axles.....	2,143	1,043	18,413	7,214
Iron castings.....	675	512	9,161	6,974
Steel castings.....	132	273	2,682	2,448
Forgings.....	489	361	6,293	4,221
<i>Castings and forgings.....</i>	<i>4,233</i>	<i>4,563</i>	<i>57,535</i>	<i>41,540</i>
Total.....	239,269	282,653	3,067,336	2,832,413

Imports (In Gross Tons)	December		Twelve Months Ended December	
	1935	1934	1935	1934
Pig iron.....	16,289	3,642	130,937	115,470
Sponge iron.....	176	102	1,460	898
Ferromanganese and spiegeleisen <sup>1</sup> .....	4,186	3,534	54,007	39,961
Ferrochrome <sup>2</sup> .....	21	...	32	74
Ferrosilicon <sup>3</sup> .....	98	274	781	993
Other ferroalloys <sup>4</sup> .....	...	...	1	46
Scrap.....	10,970	4,489	64,733	44,421
<i>Pig iron, ferroalloys and scrap.....</i>	<i>31,740</i>	<i>12,041</i>	<i>251,951</i>	<i>201,863</i>
Steel ingots, blooms, etc.....	40	312	2,085	2,137
Wire rods.....	1,287	962	16,781	10,655
<i>Semi-finished steel.....</i>	<i>1,327</i>	<i>1,274</i>	<i>18,866</i>	<i>12,792</i>
Concrete reinforcement bars.....	362	37	3,108	1,276
Hollow bar and drill steel.....	83	59	1,172	778
Merchant steel bars.....	...	1,443	8,439	18,854
Bars, whether solid or hollow <sup>5</sup> .....	2,586	...	16,311	...
Iron slabs.....	...	...	...	1
Iron bars.....	480	88	1,854	802
Boiler and other plate.....	140	38	681	284
Sheets, skelp, and saw plates.....	1,052	143	11,054	4,360
Tin plate.....	6	27	188	125
Structural shapes.....	4,414	1,662	40,397	23,913
Sheet piling.....	978	...	1,203	1,109
Rails and rail fastenings.....	703	50	5,658	3,075
Welded pipe.....	511	74	4,764	1,740
Other pipe.....	1,712	270	15,822	3,068
Cotton ties.....	...	...	8,136	...
Other hoops and bands.....	2,140	1,033	22,446	17,910
Barbed wire.....	2,192	332	24,912	8,860
Round iron and steel wire.....	337	211	3,924	2,577
Telegraph and telephone wire.....	...	3	38	47
Flat wire and strip steel.....	192	180	1,888	1,805
Wire rope and strand.....	278	80	2,141	1,513
Other wire.....	145	52	1,360	800
Nails, tacks, and staples.....	2,114	435	21,319	7,016
Bolts, nuts and rivets.....	22	8	296	250
Horse and mule shoes.....	38	49	590	428
<i>Rolled and finished steel.....</i>	<i>20,485</i>	<i>6,274</i>	<i>197,701</i>	<i>100,591</i>
Malleable iron pipe fittings.....	...	...	46	...
Cast iron pipe and fittings.....	...	...	76	65
Castings and forgings.....	126	119	1,314	1,479
Total.....	93,678	19,708	469,954	316,790

<sup>1</sup> Manganese content. <sup>2</sup> Chrome content. <sup>3</sup> Silicon content. <sup>4</sup> Alloy content. <sup>5</sup> New class. No comparable figures for 1934 or previous years. <sup>6</sup> New classification as result of the Reciprocal Trade Agreement with Belgium. No comparable figures for previous year.

MARKED by substantial increases in numerous items, the iron and steel export trade of the United States during 1935, amounting to 3,067,336 gross tons, established a new post-war record by eclipsing the 1929 total by 29,479 tons. This was a rise of 12 per cent over the 1934 trade, which was the peak over the previous five-year period, and was 129 per cent over the tonnage of shipments effected in 1933.

Scrap exports aggregated 2,107,814 tons and accounted for 69 per cent of the 1935 shipments, an increase of some 15 per cent over the earlier year. Sales of non-scrap items amounted to 959,522 tons.

Imports during 1934 reached a total of 469,954 tons, recording a rise of 48.4 per cent over receipts in the previous year. Pig iron continued to be the leading product in this trade. Scrap imports were also prominent, the volume of 64,733 tons being sharply increased.

December exports of 239,269 tons were 16.9 per cent higher than in the previous month, but declined 15.3 per cent from those made in the corresponding month of 1934.

## Sources of American Imports of Iron and Manganese Ores

	(In Gross Tons)			
	December		Manganese Concentrates, 35 Per Cent or Over	
	1935	1934	1935	1934
Canada.....	90	...	...	2,075
Cuba.....	32,000	11,000	...	...
Chile.....	65,225	42,900	...	...
Spain.....	...	53	...	...
Norway.....	22,979	6,791	...	967
Sweden.....	...	...	...	...
French Africa.....	...	...	...	...
Russia.....	7,850	7,900	1,906	...
India.....	...	...	...	...
Brazil.....	...	...	6,633	...
West Africa.....	...	...	3,851	...
Other.....	...	...	...	...
Countries ..	9,428	4,050	593	...
Total.....	137,572	72,694	12,983	3,042

## United States Imports of Pig Iron by Countries of Origin

	(In Gross Tons)			
	December		Twelve Months Ended December	
	1935	1934	1935	1934
United Kingdom.....	675	...	14,590	600
British India.....	4,704	3,308	36,162	36,013
Germany.....	1,450	...	4,877	...
Netherlands.....	7,025	...	48,122	61,939
Canada.....	694	284	13,771	8,984
France.....	...	...	50	100
Belgium.....	...	50	100	100
Norway.....	25	...	2,420	2,185
Sweden.....	...	...	907	991
Russia.....	1,716	...	9,124	...
All others.....	...	...	904	4,558
Total.....	16,289	3,642	130,937	115,470

When the specifications say:

# "housing of Durez"

## THE PRODUCTION DEPARTMENT

**says:** "Fine! Molding it of Durez will cut the number of operations in half, for it will come right out of the mold complete with mountings, the trade-mark and the final finish. Simplifies insulation, too, for Durez is dielectric."

## THE SALES DEPARTMENT

**says:** "That will give us what we've been asking for . . . lighter weight, easier handling and better appearance. That smooth, lustrous Durez finish will make it look as good as it is! When can we get it?"

## YOUR CUSTOMERS WILL SAY

"I like it. It's good-looking . . . and so light and easy to handle. I've had mine a year, used it every day . . . and yet it's just as 'new' as the day I bought it."

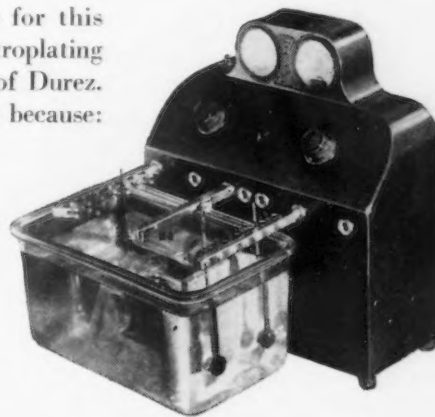
**DUREZ** is a hot-molded plastic, simultaneously formed and finished in steel dies. Strong, light, non-metallic, heat-resistant, and chemically inert, its finish can't rust or wear. There are 307 Durez compounds, each with a specific use. When you consider molded plastics, let our technicians specify the proper compound for the job. For further data write (telling us what you make) for monthly "Durez News." General Plastics, Inc., 12 Walck Road, North Tonawanda, N. Y.

# Durez



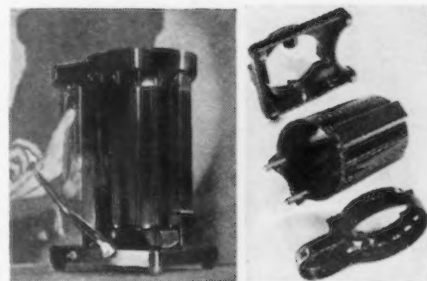
All the working elements in this American Injector Company's thermostatic expansion valve are housed in a molded Durez jacket. It protects the entire mechanism from moisture and dirt . . . insuring its proper function.

The complete case for this Hanau dental electroplating machine is molded of Durez. Hanau chose Durez because: it provides necessary electrical insulation . . . its surface resists the electrolytic acids and scratching, denting, corroding . . . it's strong—yet light in weight.

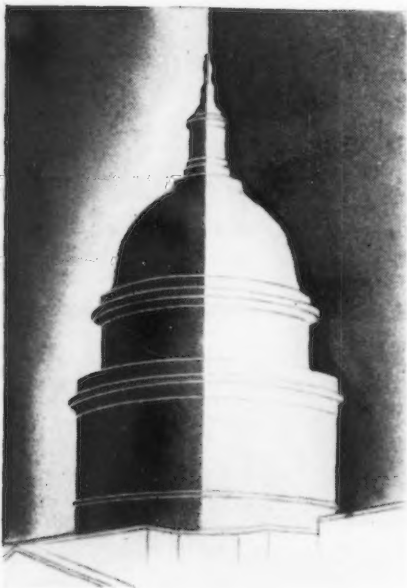


The entire housing of this Andis Speedwhip is molded of Durez. Andis found that the Durez housing eliminates many production operations and costs less

than a metal one. In addition, it's a better housing. It's lighter in weight and the finish produced during the molding operation, won't dull, scratch or corrode. Durez' dielectric strength makes other insulation of the switch connections unnecessary.







# THIS WEEK IN WASHINGTON

***Withdrawal of United Mine Workers from A. F. of L. is expected as result of repudiation of Green policies.***

° ° °

***O'Mahoney licensing bill is newest threat to industry.***

° ° °

***Industrial cooperation council to have another meeting on Feb. 10 as Major Berry refuses to give up.***

° ° °

***Court test of Wagner-Connery act is expected this spring with labor relations board anxious to establish its validity.***

° ° °

***Tin plate scrap embargo bill is passed by House.***

° ° °  
By L. W. MOFFETT  
Resident Washington Editor,  
The Iron Age  
° ° °

WASHINGTON, Feb. 4. — United Mine Workers of America have broken out in rancorous condemnation of their parent body, the American Federation of Labor, and threaten to secede as they belligerently lay lines for an intense drive for industrial organization in the steel, automotive, textile and other mass industries. . . . Definite withdrawal was plainly indicated Monday afternoon after President Green of the A. F. of L., in a vigorous address to a hostile convention, appealed to the delegates not to secede from the parent body. . . . As he left the platform, Mr. Lewis arose and received no response when he inquired if any delegate wanted to speak in favor of Mr. Green's suggestion. . . . Then Mr. Lewis asked that all those who wanted to carry on the fight for the industrial type of union stand. . . . As one man, the delegates leaped to their feet and burst into loud applause. . . . Turning to Mr. Green, Mr. Lewis said: "President Green, you have received the answer of the United Mine Workers of America. I trust you will carry back to your organization our answer."

Thus the die was cast. . . . Mr. Green, frequently booed by the bel-

ligerents, really had made an able defense, both of himself and the A. F. of L. . . . His address lasted more than an hour, and he pointed out that the A. F. of L. was committed to the craft union and that as president he must carry out that policy. . . . But he said greater freedom toward organization under broad charters had been allowed as in the case of the automobile workers. . . . In vain he attempted to convince the delegates that their allegiance was to the A. F. of L. first, but this only brought further boos and cries that the convention would stick by President Lewis. . . . Futile, too, was the warning that if organized labor were divided it would be conquered by its enemies. . . . The convention was in no mood to heed any of his suggestions and his words, forceful and often full of punch, got him nowhere. . . . Prior to the Green address, the convention adopted a resolution for or-

ganization of captive miners to "smash the steel trust." . . . The convention ordered an organizing campaign in the captive mines, thus showing further that the rebelling industrial unionists propose to center lively activities both within the steel industry and the mines it operates. . . .

The rift between industrial and craft unionists within the American Federation of Labor, of course, is not new. . . . The organization, committed to the craft union policy, succeeded the radical Knights of Labor, which endeavored unsuccessfully to organize all workers, both industrial and agricultural, and did amass a membership of some 700,000 at the peak of its strength in 1886 after 17 years' existence. . . . Failure of strikes it instituted brought a decline in its strength and the craft union took control of organized labor under the banner of the American Federation of Labor,

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equipment . . . lower over-  
all cost—**DEPEND ON**  
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J & L supplies steel of the *right* analysis to meet any *special* requirements within the scope of carbon steel. J & L Forging Steel is manufactured under exact control or rolling. It has uniform high quality. Inspections to check chemical composition and physical properties, tests, and methods of analysis employed by J & L, were developed especially for forging steel. Many well known forge shops depend upon the quality and uniformity of J & L Forging Steel to meet *all* their forging requirements.

In you have a forging job that requires a special analysis of steel, a J & L metallurgist, specializing in forging steel, will be glad to consult with you. Make your forgings show a *profit!* Specify J & L forging steel.

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STEEL**

which was formed in 1881 but did not take its present name until five years later. . . . With its ups and downs, never representing more than 10 per cent of the workers of the country, with a present membership estimated at some 3,000,000 . . . its organization reflected another cycle of craft-industrial unionism, for hardly had the United States gained its independence until craft unions were established, the first being the Philadelphia Carpenters, in 1791. . . . Now the Committee on Industrial Organization, of which Mr. Lewis is the outstanding member, just as he is the strongest single force in organized labor today, proposes to switch back to the cycle of industrial unionism and make it nationwide, with his own organization, the United Mine Workers, of some 400,000 members, the most powerful industrial union group, wildly acclaiming his efforts. . . . If secession from the ranks of American Federation of Labor actually takes place, history will be only repeating itself, for secession within its ranks is not new. . . . The I.W.W., set up in 1905, was an offspring of the A. F. of L., and was made up of radicals whose brief but violent career of socialism and communism centered on industrial unionism, and it has its own offsprings today who are active but who dislike Mr. Lewis as cordially as they dislike those whom they contemptuously term "capitalists." . . .

William Z. Foster, an avowed I.W.W., boring within the ranks of the American Federation of Labor, organized a radical group under the A. F. of L. cloak as he headed the abortive steel strike in 1919, after taking over control from President Gompers, who had demanded union recognition by the steel industry. . . . When the trouble was ended the industry's only organized labor group, the Amalgamated Association of Iron, Steel and Tin Workers, remained in the saddle. . . .

And students of labor movements today predict that craft unionism will successfully meet the challenge of the Committee on Industrial Organization. . . . Whatever may be the outcome in the future of efforts toward industrial unionism, which Mr. Lewis insists is necessary to bargain with modern industrialism, it is pointed out that the craft unions, with twice the membership of industrial unions, remains too strong to be overcome at the present time. . . . This is only one of the obstacles the industrial union group has to face, for by their vicious attacks on President Green, the executive

council of the A. F. of L., and the Federation itself, they have aroused deep animosity. . . .

The United Mine Workers have broken from the traditional policy of organized labor by going in for partisan politics as reflected in the convention's official endorsement of President Roosevelt, throwing their support and money back of the President for reelection. . . . This action called to mind the fact that shortly before the convention met, Mr. Lewis called on the President and had a long conference with him, in which the union leader is said to have informed the President that the latter could get any sort of endorsement he desired at the hands of the miners. . . . Mr. Lewis is rated as a Republican, but in return for legislative enactments supported by the New Deal he is naturally an enthusiastic supporter of the President. . . . This means the vast majority of members of the union will go to the polls in November and cast their ballots for the reelection of the President. . . . This departure of organized labor into partisan politics hails a most interesting policy. . . .

The possibility of a repercussion is seen by those who think the action might further offend craft unionists should they construe the move to mean that the White House has lined up with the opposing industrial union group. . . .

In any event, the United Mine Workers are playing extremely close to the national Administration, as are other industrial unionists who are joined together in the move to organize mass industries, including Sidney Hillman, president of the Amalgamated Clothing Workers of America, who pledged the support of his organization of 150,000 members as he told the miners he was glad they had given their officers the right to withdraw from the American Federation of Labor. . . .

The United Mine Workers saw to it that they were addressed by prominent and sympathetic New Deal officials, as well as Senator Guffey of Pennsylvania, one of the authors of the Guffey-Snyder coal act, legislation pressed by the United Mine Workers and urged by the President, "however doubtful its constitutionality." . . . From New Deal Administration circles the convention drew as speakers, Secretary of Labor Frances Perkins, Assistant Secretary Edward F. McGrady, himself an A. F. of L. member, and Assistant Secretary of the Treasury Josephine Roche, mine owner. . . . The President had been invited to address

the convention, but through a message brought by Miss Perkins the President expressed his "felicitations and well wishes for a successful session" and made known his "great disappointment" at being unable to attend. . . . Mr. McGrady made the usual slashing attack on critics of the Administration and referred to certain business groups as Tories, which is also the usual thing. . . . Major George L. Berry, head of the Pressmen's Union, also addressed the convention and in return his Council for Industrial Progress was endorsed by resolution. . . .

The move for industrial unionism also is up against the fact that the bulk of employees in such industries as steel have resisted organized labor efforts to a remarkable degree, and though organized labor groups assail the company union representation plan, it continues to prevail predominantly in these industries. . . . Management policies, together as to wages, welfare and working conditions, are also maintaining that plan. . . . The industrial labor groups also will probably have to face outbreaks both within and without from sources of radical groups which are as hostile to them as the industrial unionists are to craft unionism, for the industrial union drive is supposed to have in mind the keeping from its ranks so-called radical forces and for the present it is frowning on the idea of a political party, though many think such a party is an ultimate objective. . . .

The executive council of the A. F. of L., at its Miami meeting, went on record in favor of organizing the steel industry through the Amalgamated Association. . . . Mr. Lewis has said the council's plan of campaign in the steel industry simply provides for the status quo. . . . He is especially eager to organize industrial unionism in the steel industry, and it would not be surprising if the drive in that industry moves simultaneously with the prospective intensified drive by the Amalgamated Association. . . . It may be increasingly active among employees in the plant representation plan, which would make the steel industry the cockpit of sharp differences within the ranks of labor with possible implications that are disturbing. . . . Mr. Lewis has said that the steel industry is the greatest menace in the country to organized labor and for that reason the belief has been expressed that he will seek to make it the first target in the drive for industrial unionism. . . .

Industry, long aware that the



breathing spell, if any, is over, now is being threatened with compulsory Federal licensing. . . . Chairman Wheeler, Democrat, of Montana, has announced that the Senate soon will begin hearings on the bill of Senator O'Mahoney, Democrat, of Wyoming, requiring Federal licensing of corporations engaged in interstate business. . . . The campaign for enactment of the bill has started and it has the support of organized labor, since the bill would authorize the Federal Trade Commission to deny licenses to such corporations unless they adhere to regulations prohibiting child labor, discrimination against female workers, guaranteeing labor the right of collective bargaining and giving all stock in corporations full voting power. . . . It is recognized as having commendable features, such as prohibition of child labor, but the protest made is that it would set up a tremendous Federal bureaucracy and make it compulsory. . . . Although Senator O'Mahoney says the bill is not a new NRA, it is looked upon as being precisely that and even as another typical effort at surmounting Supreme Court decisions, including the one holding NRA unconstitutional. . . . Among organizations which will appear against the bill is the National Association of Manufacturers. . . . The association also has filed a brief against another bill intended to set up a "little NRA" in the textile industry, offered by Representative Ellenbogen and now before the House Committee on Labor. . . . Apparently the thought is that NRA can be engrafted into the entire industrial structure by one means or another despite the demise of the Blue Eagle. . . . It is perhaps also true that the bills being offered are designed to anticipate adverse decisions against the Guffey coal act and the Wagner labor disputes act. . . . Senator O'Mahoney likens his licensing bill to legislation shaped 30 years ago to "prevent the sort of business practices which drove us into the depression." . . . Evidently reference was to legislation proposed by former President Taft and subsequently by former President Wilson. . . . Their proposals, however, did not provide for mandatory licensing. . . . They called for permissive legislation by which any corporation desiring to do so could apply for and obtain Federal rather than state charter, and did not carry the labor provisions present in the O'Mahoney bill. . . .

Then there is to be further "probing" by the Munitions Committee after all. . . . Though verbally chastened by colleagues in

the Senate for his "smeared Wilson" remarks, and told he would get no further funds to continue the "investigation into the munitions industry," Senator Nye has managed to wheedle an additional appropriation of \$7,369, with the understanding that the show must end within 10 days and a final report made late in February or early in March. . . . After again calling J. P. Morgan, Thomas W. Lamont and George Whitney, the committee will turn to other witnesses who have been asked to appear before it, including some steel manufacturers. . . . The Senate, though thinking lightly of the committee's performance and its failure to develop anything at all new, apparently voted the new appropriation for fear that failure to do so would bring down upon its head the condemnation of those who harp on the profit motive back of war. . . . It would make a good soap box appeal. . . .

#### PWA Loan for Crossing Elimination

A PWA loan of \$500,000 to Akron, Ohio, to aid in the construction of the Miller Avenue and South High Street crossings over the tracks of the Pennsylvania, Baltimore & Ohio and Erie Railroad has been announced by Harold L. Ickes, Public Works Administrator. The loan will be used in paying the city's share of the cost of the project and with it has been made a grant of \$250,000 from the funds set aside for the grade crossing elimination program.

#### Industrial Cooperation Council Committees Meet Feb. 10

Acting upon the call of Industry Coordinator George L. Berry, the seven committees of the Council for Industrial Progress will meet in Washington Feb. 10 to draft reports which will be submitted later to a full meeting of the council "for whatever action may be decided upon." Major Berry announced that experts from industry and the Government have been asked by several committees to appear and discuss the study subjects and that "any persons from industry management and labor who desire to appear before any committee or submit briefs will be given that opportunity upon request to the coordinator." The subjects being studied by the committees, he stated, are: National industrial policy; maximum work week; general wage and child labor; fair trade practices; internal and external competition affecting American standards; Government competi-

tion with private enterprise; anti-trust laws and Federal Trade Commission act; financial aid to small enterprises.

Joint chairmen of the council are: For industry management: John G. Paine, chairman of the Music Publishers' Protection Association; for labor: William Green, president, American Federation of Labor.

#### Major Berry Analyzes Unemployment

Approximately 45 per cent of the wage earners in the iron and steel industry are employed in plants which employ less than 500 men, according to a booklet issued by the Coordinator for Industrial Cooperation, Washington. Some 20 per cent of workers in transportation equipment plants and 55 per cent of those working in machinery making factories exclusive of transportation equipment are in establishments employing less than 500 persons. Slightly more than 60 per cent of the total number of wage earners in all manufacturing industries are in the smaller plants.

Production, employment and payrolls all are at the highest point since 1929. Last year production increased 8.25 per cent to reach an eleven month average of 74.63. Payrolls had a 63.84 per cent average for 1935 while employment advanced to 74.26 per cent.

In January, 1929, 94 per cent of the employable persons in the country or 35,535,000 were employed. In November, 1935, only 77 per cent or 29,125,000 were employed which represents a decrease of 6,410,000 workers. The latest figures on unemployment, therefore, according to the data in this booklet, show 10,669,000 out of work in January, 1936.

#### Cast Iron Test Methods Improved by Bureau of Standards

Better control of the properties of cast iron may result from an improvement in the technique of casting test bars which has been developed in the experimental foundry of the Bureau of Standards.

Commenting on this work, C. M. Saeger, Jr., in charge of the foundry, explained that the so-called "arbitration bar" is very widely used for specifying the properties of cast iron. That the preparation of these bars is free from "burnt on" sand and other surface defects is important as such defects may seriously impair the transverse strength. A pitted or roughened surface may cause early breaking of the bar by stress concentration

due to the so-called "notch effect." A study of molding material and casting technique to produce test bars free from such defects has been under way at the bureau for some time, it was stated.

In the bureau's improved method, transverse test bars are cast in green sand molds made of a mixture of eight parts of iron molding sand and one part of sea coal, the mold cavities being faced with a carbonaceous non-graphitic material.

The test bars, which were of various diameters and cast by four different methods, have been employed in testing several types of cast irons heated to several maximum heating temperatures, the metal being poured approximately 300 deg. F. above the liquidus temperature.

Test bars vertically cast and bottom poured have shown the greatest uniformity in dimensions and hence have given most consistent results, according to Mr. Saeger. The transverse strength has been found to increase with increase of the maximum heating temperature.

#### Tin Plate Scrap Embargo Bill Passed

By a vote of 139 to 14, the House on Monday passed a bill embargoing exportations of tin plate scrap except upon Presidential license. The bill having previously passed the Senate, now is before the President for signature. It was urged as a conservation measure intended to preserve tin and was recommended by the War Department. Under the measure no tin plate scrap can be exported 60 days after passage of the act without a Presidential license. The bill was brought up under suspension of rules and quickly passed by the House.

#### Labor Board Hopes for Test This Spring of Wagner-Connelly Act

A test case this spring before the Supreme Court of the constitutionality of the Wagner-Connelly labor disputes act is hoped for the National Labor Relations Board. The board's desire to this end was made known by its chairman, J. Warren Madden, in the course of testimony before the Appropriations Committee of the Senate on the deficiency bill which provides funds for the board. The bill carries \$275,000 for board expenses for the remainder of the present fiscal year. Mr. Madden asked that the appropriation be increased \$125,000, and was told he would have to get approval of the Bureau of the Budget first.

In pointing out that there are 19 injunction suits pending against enforcement of the Wagner-Connelly act, Mr. Madden said he was hopeful of getting a test in the Supreme Court this spring from one of two of the board's own cases. He did not specify the cases.

Mr. Madden took a critical attitude of the handling of Wagner-Connelly act cases by the courts. He said the board was in the "anomalous situation of having district judges, who are directed by statute not to disturb our cases, reach out with anxiety to get them," while "The Circuit Courts

of Appeals, which are directed by the statute to handle our cases expeditiously, have great hesitation in doing anything with them."

He charged that some District Courts, including that of Judge Otis of Kansas City had even enjoined the board from holding hearings. Democratic members of the committee expressed surprise at this statement and Senator Hayden of Arizona, suggested that "The next thing, they (judges) will enjoin you from having meetings of the board."

Judge Otis recently held that the act is unconstitutional.

## LETTERS TO THE EDITOR

### Our Apologies to Mr. Heinz

*Editor, The Iron Age:*

OUR attention has been called to a statement made in an editorial entitled "Whose Overcoat are you Paying for?" appearing in IRON AGE for Dec. 19, 1935. The statement in question is as follows:

"Even Mr. Heinz has to tell how much benzoate of soda he puts into each bottle of ketchup."

While we are flattered that the name of Heinz is so well identified with ketchup, we regret that such an illustration appealed to the writer of the editorial as being apt. We are rather sensitive to the association of our name with benzoate of soda, which fact, no doubt, was entirely unknown to the writer of the editorial.

In 1906 and the years immediately preceding, we were quite active with Dr. Wiley, other members of the Federal and State food departments, and with several other manufacturers of food products, in attempting to clean up the food industry as it was then operating, and one of the very controversial issues of this campaign was the use of artificial preservatives and especially benzoate of soda in ketchup. Our efforts at that time were successful in that a Pure Food Law was passed in 1906 which, while not perfect, was a big step ahead and a real milestone of progress in the food industry. However, this did not end the benzoate of soda controversy, as it was continued in several of the States and came to a very definite issue in the State of Indiana in 1909, where we supported Dr. Barnhardt, who was the Food Commissioner at the time, in his attempt to eliminate the use of this

preservative. The fight was so long drawn out and became so bitter that it has left an indelible impression on all of us in the Heinz organization and on many others in the food field.

While we have never felt qualified to enter into any discussion as to just how poisonous benzoate of soda might be, we have felt very strongly that its use permitted the making of ketchup from very poor raw material and constituted a very definite deception of the public.

Under these circumstances, any public statement appearing that might be construed as intimating that Heinz uses benzoate of soda in ketchup is bound to raise some comment, not only in our own organization, but among outsiders, and as a matter of fact it was an outside concern who brought this editorial to our attention.

We have spent much time and money to inform the public of our stand on this matter, and very much regret to see any such statement as the one referred to above which might leave a false impression on those reading it.

*H. J. Heinz Company.*

E. D. McCAFFERTY,  
SECRETARY

*Editor, The Iron Age:*

In one particular, the article on "Manufacturing Airplane Struts," by F. L. Prentiss in THE IRON AGE of Dec. 12, 1935, is, we feel, unjustifiably prejudicial to the merits of the oxyacetylene flame. This is:

"With the higher temperature of the atomic hydrogen flame, which is 6000 to 7000 deg. F., as compared with a gas flame temperature of 3500 deg. F., the metal is brought to the fusion point more rapidly than with the gas flame, welding is done more rapidly, and the heat is more localized, not hav-



ing time to radiate into as wide an area as when the gas flame is used."

May we point out that, actually, the oxyacetylene flame temperature varies from 6000-6400 deg. F. and is prevented from reaching considerably higher levels by the fact that at these high temperatures hydrogen decomposes into atomic hydrogen and also does not react completely with oxygen because of the instability of the water vapor formed.

The temperature of the atomic hydrogen flame is similarly limited. Hydrogen passing through the tungsten electrodes into the arc is split into atomic hydrogen by the above-mentioned thermal dissociation. The temperature attainable in the gaseous atomic hydrogen is limited by the boiling point of the tungsten electrode, some 6000 deg. Assuming the atomic hydrogen stream to reach this temperature, no further increase in temperature can be obtained by a combination of the atomic hydrogen to molecular hydrogen, since this reaction is very incomplete at 6000 deg. F.

From this it will be seen that both the atomic hydrogen arc and the oxyacetylene flame temperatures are limited by the same phenomena, namely the dissociation of molecular hydrogen to atomic hydrogen at high temperatures, and in actual practice will not be greatly dissimilar.

The temperature range of 6000-6400 deg. F. for the oxyacetylene flame has been well authenticated by the work of Langmuir, Goodenough and Felbeck, Slottman and others.

G. Van Alstyne,  
Air Reduction Sales Co.

New York, Dec. 26, 1935

Editor, *The Iron Age*:

I have always given you credit for having more intelligence than you display in your analysis of the Townsend Plan in a recent issue of the *IRON AGE*.

Perhaps it is not a lack of intelligence, but a lack of decency and spirit of fair play on your part. Perhaps it is a deliberate attempt to deceive your readers. Or perhaps you haven't studied the Plan enough to understand even its basic principles. The only correct statement I can find in your editorial is the first one—"Townsend has created quite a following for his plan." Yes, 30,000,000 or more people—voters—is quite a following, when you consider that less than 40,000,000 voted in the last election for all candidates for

President, and that figure was a record vote.

Where is the money coming from? Read the enclosed clipping from the *Townsend Weekly*. It tells more clearly than I can where the money is coming from. Why do you base your argument on the national income? The Townsend 2 per cent tax is a transaction tax covering all transactions in the United States—it is not an income tax. Such well-known economists as Robert Doane state that the 2 per cent transaction tax will furnish the necessary money.

I could go on and disprove every statement you make, but what good would it do? You may not even read this letter. All I say is, you will have to think of some new arguments. Your "line" has been hashed over so many times that it is getting stale. Why don't you read a few issues of the *Townsend Weekly* and get a clear picture of what the Townsend Plan is, how it is to be financed, what it will do, etc?

You might as well try to stop the sun, the moon, and the tides as to stop the Townsend Plan. It is coming and coming soon, in spite of all the hackneyed arguments of editorial writers. It is easy enough to criticize. Why don't you suggest a better plan? No doubt you noted with great concern the election in Michigan of Verner W. Main, the Townsend supporter, to a seat in the House of Representatives. Did you know that four times as many people voted for Main as there are members of Townsend clubs in his district? No? Well, you know it now! "It's only the beginning, folks, only the beginning."

Franklin Delano Roosevelt offers Fifteen Dollar Relief. The Townsend Plan offers recovery.

Yours very truly,

Bradley Brewer.

P. S. "The power of the people once aroused in a fixed purpose is the most irresistible force in the world."—Franklin Delano Roosevelt.

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**Editor's Note**—You ask us to suggest a better plan, so here goes. If your theory is correct in that paying \$200 per month to people over 60 for not working will stimulate business so much that the increase will absorb the cost, why stop at that? We certainly should make the maximum use of such a wonderful stimulator. Why not give the old folks \$400 per month each or run the age limits down to include another ten million people? That should be twice as stimulating. And honestly, Mr. Brewer,

we would be delighted to know that we could look forward to an unearned income of this amount a few years from now.

But why do all of you New Dealers take the attitude that those who do not agree with your theories are indecent, unfair, intentional deceivers and enemies of the public? It seems to be characteristic of you from the top down. Why assume that the other fellow has cloven hoofs and that the wings and the harp are your exclusive property?

## Unemployment Shows Gradual Decline

THE total number of unemployed workers in December, 1935, was 8,979,000, according to the regular monthly estimate of the National Industrial Conference Board. This is a decrease of 218,000, or 2.4 per cent, from the preceding month, and a decrease of 916,000, or 9.3 per cent below December, 1934.

From November to December, 1935, the decreases in unemployment, by industrial groups, were: trade, 350,000; mining, 28,000; and miscellaneous industries, 7000. Unemployment showed an increase of 77,000 in manufacturing and mechanical industries; 34,000 in transportation; and 30,000 in domestic and personal service.

Compared with December, 1934, unemployment in December, 1935, decreased 23.7 per cent in manufacturing and mechanical industries; 16.7 per cent in trade; 7.2 per cent in domestic and personal service; 5.8 per cent in transportation; 0.8 per cent in mining; and 7.2 per cent in miscellaneous industries.

Sahara Coal Co., Chicago, has placed a contract with the McNally-Pittsburg Mfg. Corp., Pittsburg, Kans., for a coal tippie and Norton automatic coal washing system for a strip mine near Harrisburg, Ill. The tippie and washing plant, involving about 1500 tons of structural steel and machinery, will be completed in June and will have a capacity of 1,500,000 tons of coal per year.

Columbia Gas & Electric Corp. has announced settlement of the Government's anti-trust suit which clears the way for lending financial aid to Panhandle Eastern Pipeline Co. which has plans to extend natural gas service to Detroit.





## NEWS OF THE WEEK

### Bethlehem's Net Income Rises to \$2,396,026 in Fourth Quarter

OPERATING at 43.9 per cent of capacity during the fourth quarter, Bethlehem Steel Corp. ended the period with a net income of \$2,396,026, compared with \$701,616 in the third quarter. For the year as a whole, the corporation, with an operating rate of 39.8 per cent, netted \$4,291,253. Net income for 1934 amounted to only \$550,571.

Alluding to the corporation's greater earnings last year, Eugene G. Grace, president, stated that higher prices for steel were partly responsible, since, during 1935, Bethlehem's weighted average billing prices for rolled steel products averaged 92c. a ton higher than in 1934. On the other hand, last year's composite prices were \$2.79 a ton less than in 1929 and \$5.88 a ton less than in 1926.

The estimated value of orders on hand Dec. 31, 1935, was \$74,015,251, compared with \$63,576,530 at the end of the previous quarter, and \$56,817,681 on Dec. 31, 1934.

Steel production, at 39.8 per cent of capacity during 1935, was above the 34.9 per cent rate of the previous year. Mr. Grace pointed out that Bethlehem's current steel production is approximately 44 per cent of capacity, or about 11 per cent under the rate for the entire industry. Mr. Grace made the surmise that perhaps business in the industry during 1936 would improve by 10 per cent.

Asked about the status of Bethlehem's new finishing equipment, he stated that the continuous hot mill at the Lackawanna plant was in

full commercial production and sheets were being shipped to consumers. The continuous cold mill at the same plant will not go into production until late February or early March, and shipments from this unit will not, therefore, become a factor before the end of the first quarter. When asked whether Bethlehem anticipated any trouble in disposing of 600,000 tons of new flat-rolled products each year, Mr. Grace asserted that it has always been difficult to sell flat-rolled products in a market which has been over-capacitated for the past decade. Mr. Grace's attitude was that 600,000 tons of new capacity meant merely that the operating department had transferred a task to the selling department, and he expected the selling department to account for itself favorably.

At its recent meeting no action was taken by the directors on preferred stock dividends, since this undertaking must await the merger of the parent corporation and subsidiaries, as previously announced.

#### Republic Steel Nets \$4,455,734 in 1935

REPUBLIC Steel Corp. and subsidiaries showed a consolidated net profit of \$4,755,734 for the year ended Dec. 31, 1935, after interest, depreciation, Federal taxes and guaranteed preferred dividends of the Trumbull-Cliffs Furnace Co., etc.

In the previous year the company sustained a net loss of \$3,459,428.

Offerings of the company's \$45,000,000 4½ per cent series B general mortgage bonds at 100 were scheduled for Jan. 29.

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#### Inland Earns \$9,417,818

INLAND STEEL CO. and subsidiaries, for the year ended Dec. 31, 1935, had a net profit of \$9,417,818 after taxes and charges, compared with \$3,729,889 in the previous year. The profit for the final quarter of 1935 amounted to \$2,749,309, as against \$550,073 in the same quarter a year earlier.

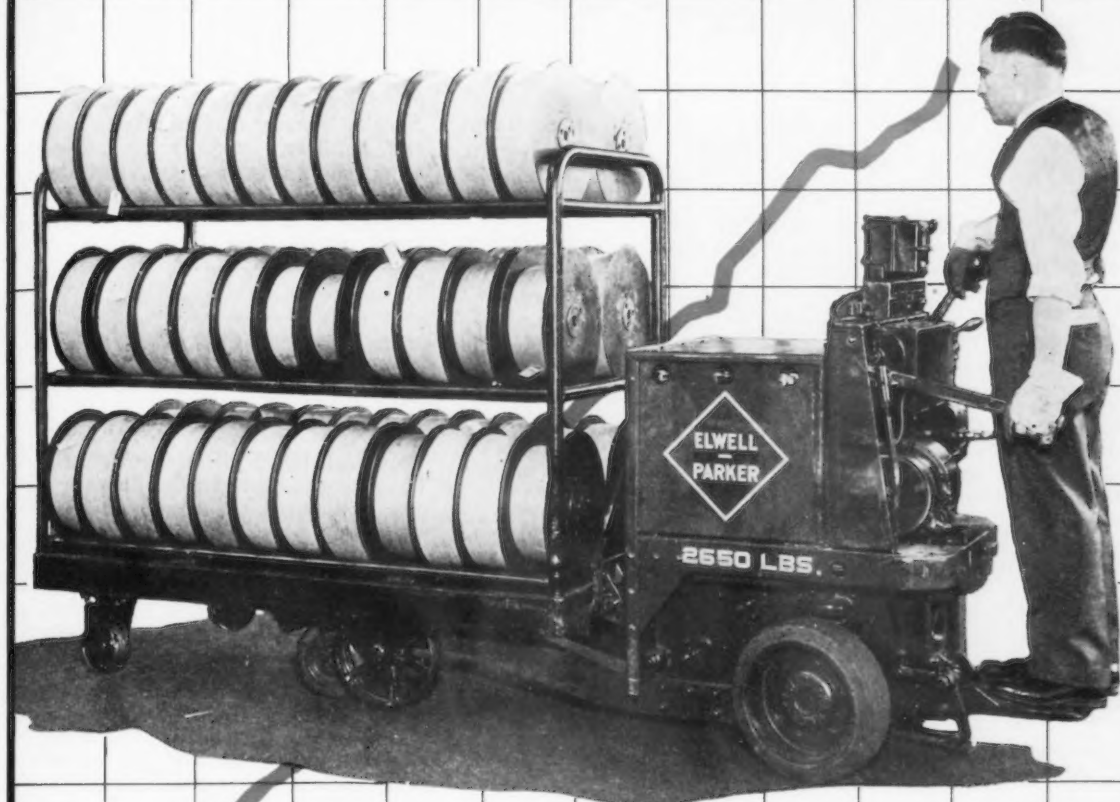
A dividend of 75c. was declared, payable March 2, 1936, to stockholders of record Feb. 14. Dividends in the two preceding quarters amounted to 50c., plus an extra of 25c.

### To Reissue Freight Rate Tariff Data

IN order better to meet the needs of members of the industry, the American Iron and Steel Institute will reissue Institute Freight Rate Tariffs No. 1, applicable via water routes to the South Atlantic, Gulf and Pacific Coast ports; No. 2, applicable to so-called Official Classification territory (east of the Mississippi and north of the Ohio and Potomac rivers); and No. 3, applicable to Southern territory, east of the Mississippi River.

The reissues will be in loose-leaf form as at present, but all subsequent rate changes will be effected through the issuance of revised pages instead of in the form of supplements as has been the practice heretofore. This will eliminate any necessity of posting changes and will make it possible to main-

# VOLUME



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Are *you* losing profits because of load-transportation equipment that once was good but is no longer *good enough*? You know, don't you, that Elwell-Parker now furnishes *complete Systems* of materials handling—not just Trucks alone—to earn big new profits for you?

These Proven Systems—1936 Models—combine

proper Engineering of suitable type Trucks, with the correct application to your present and anticipated plant layout and conditions. These will handle your goods at reduced cost, or at lowest possible expense. Naturally, each System is an individually-planned and engineered job, enabling you to realize maximum benefits from *your* Elwell-Parker Trucks.

Why not *begin* these important savings by sending for a Representative at once? The Elwell-Parker Electric Company, 4225 St. Clair Avenue, Cleveland, Ohio.

## New ELWELL-PARKER Trucks

ESTABLISHED 1893 • BUILDING POWER INDUSTRIAL TRUCKS SINCE 1906

tain tariffs currently up to date by merely substituting revised pages.

In response to the desires of various members of the industry, it has been decided to supply separately any part of the tariff showing rate data for any individual state in Tariffs No. 2 and No. 3, provided the order for such part covers five or more copies of the part relating to any one state. Such separate parts will be complete in and of themselves, including title page, rules and regulations, list of products upon which rates apply, pages of emergency charges and freight rates. Orders for such separate parts of any tariff must be placed prior to the time when such tariff goes to press.

The distribution of free copies will be discontinued and in lieu thereof a flat charge will be made for all tariffs and revised pages furnished. The following scale of prices will be charged:

	No. 1	No. 2	No. 3
New Tariffs complete (without binders).....	\$3.00	\$8.00	\$5.00
Individual part (state) (not less than five copies of a state to one subscriber) charge per sheet .....		.06	.06
Revised pages (charge per sheet) .....	.03	.03	.03

Present Tariffs Nos. 1, 2 and 3 will be cancelled as and when the new issues, which will be numbered 1-A, 2-A and 3-A, respectively, shall have been distributed.

## Ingalls Iron Works To Extend Plants

PLANS for new construction by the Ingalls Iron Works Co., Birmingham, during 1936, have been announced by R. I. Ingalls, Sr., president of the company. They include completion of the original building program at Verona, Pa. (Pittsburgh district) works, which were acquired in 1930. Work now under way at Verona comprises a new double covered crane runway (one 80 ft. and one 60 ft.) at the loading and storage end of the main fabricating shop; the extension of the North lean-to on the main building, which will be used as a beam shop, and the complete covering of the North runway. Cranes and other equipment for all extensions have been purchased.

A complete new shipyard will be constructed on the Tennessee River, at Decatur, Ala. Placing of the grading contracts this week will be followed immediately by the construction of several buildings and ways, preparatory to the starting of four boats now on

order for the Pittsburgh district. There will be about 1100 ft. of waterfront, all to be occupied by launching ways for new craft and marine ways for repair work.

The company has no immediate plans for improvements at its Mobile shipyard, where what is believed to be the largest all-welded oil tanker ever built will be launched this week.

The company has two fabricating plants at Birmingham, one of which, the Southside plant, is said to be one of the largest structural steel fabricating units in the country. The North Birmingham plant is equipped for general plate work, also for the building of standardized horizontal cylindrical tanks by automatic electric arc welding. At the same works there is a modern steel drum plant which is practically automatic in operation, including two large and modern gas-fired baking ovens, flash welders, etc. There is now being installed an automatic washing machine, developed by the company, which will be used in the preparation of sheets for the making of sanitary food containers.

## Mystic Furnace to Resume Operations

THE Mystic Iron Works furnace at Everett, Mass., will start soon, following a period of idleness of more than four years. Plans are being rushed to this end and it is anticipated the furnace will be in operation on or about April 1. The furnace has a capacity of 175,000 tons of pig iron annually, requiring directly and indirectly 2,000,000 man-hr. of labor, and 500,000 tons of raw material.

## Mining Engineers to Meet in February

The forty-fifth meeting of the American Institute of Mining and Metallurgical Engineers will be held Feb. 17 to 21 in the Engineering Societies Building, New York. Subjects range from the use of aerial reconnaissance and contour mapping in mining to the role of metals in new transportation. Also to be discussed are various aspects of mining and milling methods, ferrous and non-ferrous metallurgy, preparation of coal and industrial minerals for marketing, mining geology, geophysical methods of prospecting, safety in mines and mineral economics.

## Booklet Promotes Stainless Steel

A SEVEN-COLOR booklet pictorially presenting the many interesting uses of Allegheny stainless steels has been prepared for circulation by Joseph T. Ryerson & son, Inc., distributor. From dinner service sets to hypodermic needles to commercial castings and pipe and tubing, the manifold articles listed indicate a wide range in the metal's adaptability. Where a job is contemplated Ryerson Steel Service places at the disposal of the applicant engineering advice on special analyses of the steel and the purposes for which each is applicable. A copy of the booklet can be secured by petition to Joseph T. Ryerson & Son, Inc., Chicago.

## Republic Steel to Improve Plants

REPUBLIC STEEL CORPN., through its board of directors, has authorized the expenditure of \$1,200,000 for immediate capital improvements. The largest outlay, amounting to over \$500,000, will be made in Warren, Ohio, where the cold rolling department for strip steel will be remodeled and enlarged and additional finishing equipment will be installed to increase tinplate production.

In Youngstown, expenditures of over \$400,000 will be made, including \$250,000 in improving the electric weld tube mill No. 3 to provide a capacity for making oil well casings of larger sizes. The balance of the appropriation will be divided among manufacturing plants in other districts.

The Walker Mfg. Co., Racine, Wis., manufacturer of electric lifts, automobile jacks, etc., and its affiliate, Ajax Auto Parts Co., also of Racine, resumed operations on Jan. 14 after having been closed 108 calendar days by labor trouble. Terms of the settlement reached on Jan. 13 were not revealed. Officials of the companies and a bargaining committee of six members of the United Automobile Workers Union Local No. 85 announced the settlement a compromise and all controversial issues have been set aside. Wages were not an issue at any time, it was officially stated.

Bethlehem Steel Co., Bethlehem, Pa., has been elected to membership in the Association of National Advertisers, according to an announcement made by that organization.



# Belgian and French Wire Rod Makers Ask for Increase in Cartel Quotas

HAMBURG, Jan. 20. (By Special Correspondence).—The International Wire Rod Cartel is experiencing some difficulties because a few Belgian and French works which have increased their production of soft wire rods are now demanding higher allotments, which are being refused by the other members. It is nevertheless hoped that the extension will meet with no difficulty.

Germany's production of Thomas steel is being raised constantly in relation to the total output because the Government is artificially keeping down imports of scrap, whereas ore supplies are more liberal. In 1913 Thomas steel production amounted to 58.5 per cent of the total output but in January, 1934, it had slumped off to 28.3 per cent. In December, 1935, however, the figure had increased to 42.5 per cent.

In the recent market summary the German steel cartel denies reports that steel production of 1,600,000 tons per month which was achieved by the end of 1935, is about the maximum output possible at the present rate of consumption. They argue that the per capita consumption of steel in 1935 was 49 kg. less than that in 1913 and that a further increase is most probable. The unfilled export tonnage at the end of the year was the highest since 1929.

A particularly heavy demand is anticipated from the motor car industry which is holding its annual show at Berlin, Feb. 1 to 16. Thirty per cent more companies are exhibiting this year than last, making necessary the addition of new halls, since the former space was inadequate. There has been almost no reduction of operations in motor car construction during the winter. The outlook for the reestablishment of the international steel tube cartel remains unsatisfactory while the probability of the construction of the sheet cartel is rather promising at present.

It is interesting to note that the percentage of barter transactions in the iron and steel export trade shows a decrease when compared with 1934 and the first half of 1935. By barter transactions the German industry has forced a supply of German steel on customers who otherwise would not have purchased as great an amount. In the last quarter of 1935, however, the sellers of steel, not the buyers, were dictating the market. The German

industry has changed quickly in its selling methods and prefers cash transactions today, which have reduced the volume of barter from more than half the total export business in the first part of 1935 to scarcely more than 30 per cent. This does not mean, however, that the barter trading system is to be gradually abandoned since the selling methods may be altered again at any time. Germany's import surplus of 1934 and the first six months of 1935 has changed into an export surplus of 50 to 55 million marks a month during the last four months of 1935.

## Bridge Designing Contest Announced

REGULAR registered students of engineering and architecture in recognized technical schools in the United States and its possessions are invited to enter the eighth annual bridge design competition

### COMING MEETINGS

#### Meetings in February

Iron, Steel and Allied Industries of California. Feb. 6, 7 and 8. Hotel Del Monte, Del Monte, Cal. Annual meeting.

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Foundry Equipment Manufacturers Association, Cleveland. Feb. 8. Cleveland Hotel, Cleveland. Annual meeting. Arthur L. Tuscany, secretary.

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American Institute of Mining and Metallurgical Engineers. Feb. 17 to 21. Engineering Societies Building, New York. A. B. Parsons, 29 West Thirty-ninth St., New York, secretary.

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American Society of Mechanical Engineers in cooperation with the American Foundrymen's Association. Feb. 27 and 28. Annual foundry practice conference. Birmingham. C. E. Davies, 29 West Thirty-ninth St., New York, secretary.

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American Gear Manufacturers Association. April 20 to 21. Annual convention. Adelphia Hotel, Philadelphia. J. C. McQuiston, Penn Lincoln Hotel, Wilkesburg, Pa., secretary.

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American Foundrymen's Association. Week of May 4. Annual meeting. Detroit. C. E. Hoyt, 222 West Adams Street, Chicago, secretary.

of the American Institute of Steel Construction. The subject of the competitive design is a steel highway bridge. Preliminary drawings are due not later than April 11, 1936, and final drawings not later than May 9, 1936.

The best design will receive a cash prize of \$100 and the second a cash award of \$50. Certificates of award will be given the prize winners and those whose designs are judged worthy of honorable mention.

A full list of rules and requirements may be obtained from the American Institute of Steel Construction, 200 Madison Avenue, New York.

## Combustion Engineering Conference Scheduled

PLANS are rapidly being formulated for the annual conference sponsored by the combustion engineering division of the Association of Iron and Steel Electrical Engineers to be held at the Ohio Hotel, Youngstown, April 22 and 23.

Among the subjects to be discussed at this yearly meeting, which usually attracts over 1000 steel mill executives and engineers from every section of the United States, will be the cleaning of blast furnace gas, refractories, and other related subjects to the blast furnace, open-hearth, and rolling mills.

During the course of this conference, it is also planned to have an inspection trip to one of the recently completed hot strip mill installations in the Youngstown district.

## General Electric Makes Safety Record

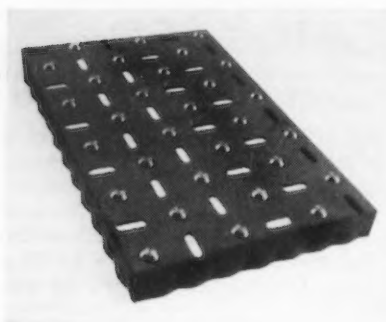
NOT one fatal accident from an occupational cause was suffered by a General Electric employee during 1935, according to a report recently compiled by the company's general safety committee.

The report also shows that apparently safety consciousness, instilled at work, carries on after the whistle blows, for among the company's employees there were the fewest number of non-occupational accidental deaths for any year on record. Only 16 such deaths occurred during 1935, seven less than during the previous year. Of these, automobile accidents claimed the largest number of victims with seven deaths.

## Bethlehem Announces Steel Paving Plates

A NEW type of permanent and protective surfacing for concrete floors and paving, known as Bethlehem steel paving plates, has just been placed on the market by the Bethlehem Steel Co. These plates, which are 12 in. by 18 in. with 1½ in. sides and are made of ¾ in. rolled steel, are designed for installation on the surface of concrete slabs to which they are anchored and with which they become an integral part.

Two types of these plates are



available, one intended for use on roadways and the other for plant floors, loading platforms and docks. The roadway type is equipped with button-head studs, making it non-skid. The sides are perpendicular to the surface and are so crimped as to give the plates firm anchorage in the concrete. Additional anchorage is provided by studs which extend into the concrete. The slots in the top of the plates are filled with the fresh concrete when they are being laid, thus providing an additional bond between concrete and plate, and at the same time, increasing its non-skid qualities.

The surface of the floor type plate is smooth with long-shank anchorage studs with flat heads, fastening through countersunk holes, making them flush with the top surface of the plate. This type plate is intended for use in warehouses, breweries, docks and loading platforms, where heavy goods are ordinarily conveyed on trucks with steel wheels of small diameter and small flange width. Like the road plates, the floor paving plates are anchored securely to the slab, becoming an integral part of it, and are built to stand up through unusually long periods of severe service.

The road paving plates are also built to withstand continuous heavy traffic. It is claimed that maintenance is not required by the

use of this plate, which means that a constantly-traveled traffic artery need never be torn up for repairs, with the consequent disturbance of traffic. The projecting studs on this type plate are made of special-analysis steel and are tough and practically wear-resistant and are so placed that the rubber tires of vehicles riding over them are thoroughly gripped between them, thus providing a skid-proof surface.

Bethlehem's plates are light in weight, being only about one-third as heavy as the cast iron blocks which are sometimes used for paving purposes also. They are said to be easily handled and speedily laid without the use of skilled labor. The concrete base is protected from severe strain because the size of the plates distributes the weight over a large area.

Bethlehem has issued a four-page booklet which describes and illustrates these two new types of paving plates. Sketches are included which provide adequate instruction for installation.

## New Expansion Joint For Concrete Pavements

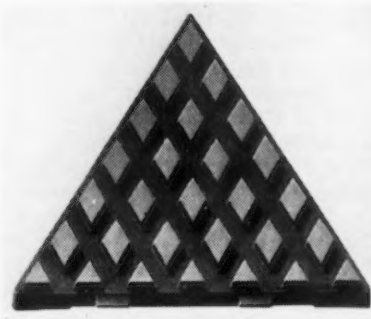
A NEW use is provided for steel in paving highways in a dowel and joint support for expansion and contraction joint in concrete pavements, which is being placed on the market by the Wheeling Corrugating Co., Wheeling, W. Va. This support is a single piece of sheet steel 18 in. wide. Lugs equally spaced are punched 1 in. from each edge of the sheet and bent upward. In these are holes in which the dowel bar is inserted at the proper height. Lugs are also punched at intervals along the center of the base sheet and bent upward to support the pre-molded joint. The bars and supports are not removed after the concrete is poured.

The supports are made in standard lengths and are nested for shipment in crates. The use of the support, it is claimed, will effect considerable saving in labor in constructing pavements. From seven to nine tons of steel are required for making the joints for one mile of paving.

Midland Steel Products Co., Cleveland, has been awarded a contract by Sears, Roebuck & Co. for the manufacture of refrigerating units for a new type of kerosene operated refrigerators. This addition to its products requires additional room and the company has leased 75,000 sq. ft. of floor space in an unused manufacturing building adjoining its plant.

## Interlake to Make Iron Paving Blocks

CAST iron paving blocks which are used to some extent abroad and which have been experimented with in this country are being placed on the market by the Interlake Iron Corp., Chicago. The blocks, which are controlled by patents, are triangular in shape with diamond, ribbed or other shaped tread to provide a non-skid surface. A three-point support for each block is provided by slightly raising at the three corners the flange that surrounds the block on



the under side. This assures rigidity. The blocks are laid in a concrete foundation and provide an air space between the concrete and under side of the block.

The blocks are laid on 12-in. centers, being slightly smaller than the 12-in. triangular dimensions in order to provide space for filling in between the blocks with asphalt or concrete. They are designed for use both for pavement on highways at points where traffic is unusually heavy and for factory floors that are subjected to heavy trucking service. In addition to their ability to withstand heavier traffic the blocks, it is pointed out, are impervious to the action of weak acids, oil and grease. It is stated that they may be laid rapidly and easily taken up and relaid without damage to the block. They are made in two weights, the heavier for road paving weighing 9½ lb. and a lighter block weighing about 7 lb. is intended for factory floors.

Contracts have been let for a \$100,000 plant at Toledo, Ohio, where Interlake operates blast furnaces, to manufacture the blocks.

The paving blocks will be cast in permanent molds that will go from the blast furnace to an air furnace where the proper pouring temperature will be maintained and thus avoiding remelting. From the air furnace a ladle will carry the metal to the permanent molding machine.



# PERSONALS

JOHN HUGHES, assistant to the president, United States Steel Corp., New York, retired Feb. 1 under the corporation's pension plan. Seventy years of age, having been born in Brooklyn on Feb. 1, 1866, Mr. Hughes has a record of nearly 58 years of employment, of which the past 32 years have been with the United States Steel Corp. As assistant to the president since 1912, he has had charge of matters relating to domestic and foreign tariffs on iron and steel products, and became nationally known as an authority on tariffs. He also supervised the handling of purchases of imported products, such as pig tin, palm oil and other raw and semi-finished materials, and the technicalities of conforming to customs' regulations and practices in exporting the products of subsidiary companies. Both because of his long service and his genial personality, Mr. Hughes has an unusually wide acquaintanceship in business and official circles. During the war he was chairman of the subcommittee on pig tin of the War Industries Board, supervising the distribution of all pig tin imported into this country under regulations established by the War Industries Board and the War Trade Board. At that time he also handled exclusively all the palm oil imported for the use of the tin plate industry under the control and direction of the United States Food Administration. In 1918 he went abroad in his capacity as chairman of the pig tin sub-com-

mittee, as a member of the War Industries Board mission to London and Paris to confer with the allied governments for the control and distribution of war materials. Since September, 1934, he has been a member of the consumers' panel of the International Tin Committee, having been nominated to that post by leading American consumers of tin, including tin plate, automobile, can, solder and babbitt manufacturers. In that capacity he attended a meeting of the International Tin Committee in Paris, Nov. 22, 1934. He is a director of the American Tin Trade Association, New York. Mr. Hughes first entered employment in June, 1878, as a machine shop apprentice at the Worthington Hydraulic Works, Brooklyn. From June, 1880, to June, 1885, he served as junior clerk and bookkeeper for Warfords, Robinson & Hinman, a barge transportation firm, New York. He was a junior clerk in the New York post office from June, 1885, to September, 1886, following which he served as clerk in the United States Appraiser's Office, New York, until July, 1888, when he was promoted to examiner. He left the Appraiser's Office on Oct. 1, 1903, to become general agent of the United States Steel Products Co., New York. He remained in that position until his appointment as assistant to president of the Steel Corporation on Jan. 1, 1912. On Jan. 31, his last day before retirement, Mr. Hughes was given a dinner by executives of the Steel Corporation.

FRANK L. GIBBONS, formerly vice-president of Timken Steel & Tube Co., Canton, Ohio, has been appointed manager of sales of the newly-created alloy division, Carnegie-Illinois Steel Corp., with headquarters at Chicago. Previous to his connection with Timken, he was associated with Republic Steel Corp. and Central Alloy Steel Corp., and has specialized in the development and sale of alloy steels for more than 20 years.

♦ ♦ ♦

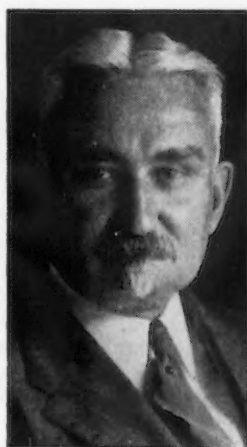
PAUL F. VOIGT, JR., formerly vice-president of the Allegheny Steel Co., Brackenridge, Pa., has been appointed manager of the newly-created stainless steel division, Carnegie-Illinois Steel Corp., Pittsburgh. He also will supervise production and sale of stainless steel made by other subsidiary companies of the United States Steel Corp. Mr. Voigt has been intimately associated with the commercial development of stainless steel in the past decade.

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ROBERT E. KINKEAD, noted consulting engineer, has been retained by the Carnegie-Illinois Steel Corp. to make a survey of its welding operations. Mr. Kinkead, whose numerous articles on welding have appeared in leading technical and trade papers, has specialized in welding throughout his entire career. A graduate of Ohio State University, he has been engaged in professional consulting work for many engineering and manufacturing companies since 1927.

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JOHANNES ERLER, metallurgist, Farrel-Birmingham Co., Ansonia,



JOHN HUGHES



F. L. GIBBONS



P. F. VOIGHT, JR.



R. E. KINKEAD



J. ERLER



Conn., has been selected as the author of the American Foundrymen's Association exchange paper to the International Foundry Congress in Düsseldorf, Germany, Sept. 15 to 20. The paper will be entitled "Studies of Casting Stresses in Chilled Iron" and will deal primarily with stresses existing in chilled iron rolls. Mr. Erler has had a well-rounded career in industry. Born in Leipzig, Germany, in 1900, he received both his preliminary and advanced formal education in that country. He attended Berg Akademie, Freiberg, Germany, and began his industrial career in this country in 1926 when he became associated with the Carus Chemical Co., La Salle, Ill., as chemist. He remained there until 1928 when he took a position as metallographist at the Wilson Foundry & Machine Co., Pontiac, Mich. In 1930, he accepted a position as sales engineer with the Eastern Clay Products Co., Buffalo. Two years later, he became metallurgist, Farrel-Birmingham Co., Ansonia, Conn., the position he now holds.

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THOMAS J. McLOUGHLIN has been appointed assistant to W. S. OBERG, manager of operations for the Pittsburgh district, Carnegie-Illinois Steel Corp. He started with the corporation at the Duquesne steel works in 1913 as an engineer apprentice, becoming fuel engineer in 1924. He was graduated from Stevens Institute of Technology, and is a member of the American Iron and Steel Institute and a director of the Engineers' Society of Western Pennsylvania.

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WILLIAM C. ACKLIN, general manager since 1926 of the Acklin Stamping Co., Toledo, Ohio, has been elected president to fill the unexpired term of the late James M. Acklin. He has been secretary of the company since 1911.

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GEORGE DANDROW, for the past few years assistant manager in the New York district of the power products and industrial department, Johns-Manville Corp., New York, has been appointed manager of the New York district of that department. He joined the organization in 1922 after his graduation from Massachusetts Institute of Technology.

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F. B. YATES, who has been identified with the Timken Roller Bearing Co., Canton, Ohio, since 1926, has been promoted to the manager-

ship of the New York district office, in charge of industrial sales. He took the company's special training course after his graduation from the Sheffield Scientific School of Yale University and, after some time in the Chicago district office, was transferred to the New York office in 1928. R. W. POWERS, a graduate from the engineering college of the University of Michigan in 1931, has been transferred from the Canton engineering department of the company to the New York district office as sales engineer.

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S. C. PARTRIDGE, heretofore assistant to E. W. AUSTIN, general sales manager, automotive division, Timken Roller Bearing Co., Detroit, has been made assistant general manager of the industrial division, with headquarters in Canton. He was graduated from the engineering school of McGill University in 1925 and has been identified with the Timken organization since that time. S. C. MERRILL, who has been manager of the New York district office and during the past year has been handling automotive applications as well as those in the industrial field, has been made Eastern district manager of the automotive division, with headquarters in Detroit. He was graduated from Columbia University in 1917 as a mechanical engineer.

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H. D. FARRIS, who since 1922 has been active in the promotion and sale of cereal binders, has been appointed Eastern sales representative of the Gratiot Lakes Foundry Sand Co., Detroit.

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LESTER W. SEAGO, for the past 10 years connected with the Ready-Power Co., Detroit, has been appointed Eastern district manager, with office at 1775 Broadway, New York. WESLEY DAVEY, who has been with the company for more than five years, has been placed in charge of all Ready-Power service in the Eastern territory.

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JOHN L. PERRY, president of the Tennessee Coal, Iron & Railroad Co., has been elected a director of the advisory board for the Birmingham Community Chest.

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J. J. SWENSON, general sales manager of the American Cast Iron Pipe Co., has been reelected president of the Birmingham Boys' Club.

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DOUGLAS P. STEWARD has been made chief engineer for the Lorain

district, Carnegie-Illinois Steel Corp. He was first employed by the Lorain Steel Co. in 1923 as draftsman. Since 1934 he has been assistant general superintendent. He is a graduate of Tufts College.

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JOHN L. YOUNG, formerly assistant general manager, industrial division, Timken Roller Bearing Co., has joined the service engineering department of the United Engineering & Foundry Co., Pittsburgh. He joined the Timken organization in 1921, first in the mine car bearing field, and later has been in close touch with the development of rolling mill machinery. In 1931 he served Timken at Pittsburgh as development engineer specializing in steel mill equipment, becoming district manager of the Pittsburgh office in 1932 until 1934, when he was transferred to Canton as assistant general manager of the industrial division.

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PHILIP S. GRAVER, vice-president of the Graver Tank & Mfg. Co., Chicago, has been appointed a member of the Chicago Park District Board.

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ANDREW GRIERSON, formerly welding engineer of the Kelvinator Corp., has joined the Detroit district sales office of P. R. Mallory & Co., as commercial welding engineer. Mr. Grierson was largely responsible for the recent changes made in the welding division at Kelvinator's Leonard plant in Grand Rapids.

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FRANK A. SCHOTTERS, vice-president and treasurer of the Luce Mfg. Co., Lansing, Mich., maker of Mastercraft truck bodies, has been elected president of the company. He will continue in the capacity of treasurer and general manager. LEE RICHARDSON, Detroit, has been named vice-president, and CARL H. REYNOLDS, secretary.

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S. E. HACKETT, president, Jones & Laughlin Steel Corp., was elected a director of the Lake Superior Iron Ore Association, Cleveland, at the annual meeting of the association, Jan. 31, to fill the vacancy caused by the death of A. B. Shepherd, vice-president of that corporation. R. C. ALLEN, vice-president, Oglebay, Norton & Co., Cleveland, was reelected president and other officers were also reelected.

# OBITUARY

WILLIAM M. MCFATE, member of the staff of American Iron and Steel Institute, died of a heart attack in New York on Feb. 1. Mr. McFate was born in Youngstown in 1894. His connection with the steel industry began in 1912 when he became associated with Trumbull Steel Co., of which he became vice-president in charge of sales. He was later with Weirton Steel Co., Detroit Steel Corp., Wheeling Steel Corp. and Youngstown Sheet & Tube Co. In 1934, Mr. McFate joined the staff of the Institute to assist in the administration of the steel code.

ALBERT F. SHORE, president of the Shore Instrument & Mfg. Co., Jamaica, N. Y., died on Jan. 17, aged 59 years. He was a metallurgical engineer and inventor, his outstanding achievement being the invention of the scleroscope in 1907. He was awarded the Elliott-Cresson medal by the Franklin Institute. He was a member of the American Society for Testing Materials, to which he had contributed many papers on physical properties of metals.

EDWARD H. HEADFORD, president of the Headford Brothers & Hitchins Foundry Co., Waterloo, Iowa, died in that city on Jan. 21.

FREDERICK R. LOW, editor emeritus and editor for many years of *Power*, died at his home in Passaic, N. J., on Jan. 22, aged 76 years. During his career as editor he was active in bringing about the enactment of safety laws to reduce the number of boiler explosions.

WILMER W. SALMON, president and general manager of the General Railway Signal Co., died in New York on Jan. 23, aged 70 years. He was identified with railroads and train equipment firms from 1886 to 1904 before becoming president and general manager of the Signal company. He was a member of a number of associations including the Western Society of Engineers, and the United States Chamber of Commerce.

RICHARD R. QUAY, who more than 40 years ago aided in organizing the Monongahela Tin Plate Co. which later became the American Sheet & Tin Plate Co., died

at Pittsburgh on Jan. 24, aged 72 years.

CHARLES W. GRAY, retired Southern sales manager of the United States Pipe & Foundry Co., died in Birmingham, Jan. 27, aged 80 years. He had been connected with the pipe industry all his business life. He joined the United States Pipe & Foundry when it absorbed the Dennis-Long Pipe Co., of Louisville. In 1916 he was sent to Birmingham as Southern sales manager and continued in that capacity until Feb. 1, 1927, when he retired.

MAX S. KAPLAN, head of the Chicago scrap iron company bearing his name, died of heart disease on Jan. 29. As a boy of 15 he went to Chicago alone from Russia.

WILLIAM H. FOLSOM, for many years purchasing agent for several Southern railroads and subsequently a partner of the Exeter Brass Works for some time, died at his home in Exeter, N. J., on Jan. 26. Mr. Folsom was born in Exeter 77 years ago, and was graduated from Harvard University in 1881.

FRANK A. POWERS, chief clerk, Edgar Thomson works, Carnegie-Illinois Steel Corp., Braddock, Pa., died suddenly at Pittsburgh on Jan. 17, aged 64 years. He started at the Edgar Thomson works in 1890 in the blast furnace department. In 1906 he was appointed assistant chief clerk and in 1928 became chief clerk.

GEORGE G. ROBERTS, president of the G. G. Roberts Co., maker of tacks and nails, Whitman, Mass., died on Jan. 21, at a Stoneham, Mass., hospital. Mr. Roberts was born in Philadelphia in 1857. In 1878 he became associated with the Pennsylvania Tack Co. Eleven years later he went to Whitman to join Dunbar, Hobart & Co. and in 1904 he and Benjamin Hobart formed a corporation. Later he acquired an interest in Dunbar, Hobart & Whidden Co.; and in 1913 formed the G. G. Roberts Co. In 1916 he purchased the Dunbar, Hobart & Whidden Co. plant.

BERNARD T. MESKER, president of Mesker Brothers Iron Co., sash and ornamental iron, St. Louis, died there Jan. 23 of a complication of ailments due to his advanced age

of 84 years. Born in Evansville, Ind., he came to St. Louis in 1879 and with his brother, Frank Mesker, started the iron company.

RADCLIFFE FURNESS, superintendent of the open hearth and forge of the Midvale Steel Co., Nicetown, Pa., died at his home in Jenkintown after a long illness. He went to work for the Midvale company after his graduation from Princeton University in 1891. He was 67 years old.

CHARLES A. GOULD, a member of the sales staff of the Denton & Anderson Co., Chicago representative of the Taylor-Winfield Corp., died on Jan. 13, aged 40 years.

SIR JOHN FIELD BEALE, chairman of Guest, Keen & Nettlefolds and of the British Iron & Steel Co., died in London recently, aged 61 years. He played a leading part in the recent reorganization of the British iron and steel industry.

## Industrial Exhibition Announced for March

AN opportunity for manufacturers to display products, service or commodities to factory executives, distributors and retailers will be provided at the Industrial Exhibition to be held in the Municipal Auditorium in Springfield, Mass., March 5, 6 and 7, under the direction of the Purchasing Agents' Association of Western Massachusetts. All western Massachusetts industries are to be invited to participate as well as a majority of concerns supplying materials to them and many nationally-known commercial leaders. Admission will be free but only by tickets which may be obtained from exhibitors who may order as many as they wish. An attendance of 20,000 is expected. J. E. Connor, president, Purchasing Agents' Association of Western Massachusetts, National Equipment Co., Springfield, Mass., is in charge.

The Philadelphia chapter of the American Foundrymen's Association will hear a discussion of modern non-ferrous foundry practice by D. M. Curry on Feb. 7 at the Engineers Club. Mr. Curry was for many years supervisor of all non-ferrous foundry production for Ford and Lincoln motor cars and Ford and Stout airplanes and engines, and is now a member of the development and research division, International Nickel Company, Inc.



# January Pig Iron Output Declines 3.8 Per Cent

**P**RODUCTION of coke pig iron during January amounted to 2,025,885 gross tons, compared with 2,106,453 in the preceding month. The daily rate last month declined 3.8 per cent, or from 67,950 tons to 65,351 tons.

There were 117 stacks making iron on Feb. 1, at a rate of 63,660 tons daily, compared with 120 furnaces operating one month before which were producing iron at a rate of 66,825 tons daily. Four stacks were blown in during the month and seven were taken out, a net loss of three. The Steel Corporation blew in two furnaces and took off four, while independent steel companies put two in operation and blew out or banked one unit. Two merchant stacks were blown out or banked.

The furnaces blown in were a Monongahela stack of the National Tube Co., an Ensley furnace of the Tennessee Coal, Iron & Railroad Co., an Aliquippa furnace of the Jones & Laughlin Steel Corp'n. and a Cambria unit of the Bethlehem Steel Co.

Blown out or banked were a Duquesne, an Edgar Thomson, a Clairton and a Gary furnace of the Carnegie-Illinois Steel Corp'n., a River furnace of the Republic Steel Corp'n., a Shenango furnace of the Shenango Furnace Co., and one Woodward unit of the Woodward Iron Co.

## Daily Average Production of Coke Pig Iron

	Gross Tons				
	1936	1935	1934	1933	1932
January .....	65,351	47,656	39,201	18,348	31,380
February .....	57,448	45,131	19,798	33,251	31,201
March .....	57,098	52,243	20,787	28,430	25,276
April .....	55,449	57,561	28,621	20,935	24,166
May .....	55,713	65,900	24,536	28,412	18,461
June .....	51,750	64,338	59,142	17,115	19,753
1/2 year.....	54,138	54,134	43,754	20,800	21,042
July .....	49,041	39,510	36,174	17,615	23,733
August .....	56,816	34,012	26,199		
September .....	59,216	29,935			
October .....	63,820	30,679			
November .....	68,864	31,898			
December .....	67,950	33,149			
Year .....	57,556	43,592			

## Production of Coke Pig Iron and Ferromanganese

	Gross Tons		Ferromanganese†	
	Pig Iron*		1936	1935
	1936	1935		
January .....	2,025,885	1,477,336	24,766	10,048
February .....	1,608,552	1,608,552	12,288	17,762
March .....	1,770,028	1,663,475	18,302	17,541
April .....	1,727,095	1,552,514	12,961	88,902
June .....	9,799,000	1,520,263	12,175	12,735
1/2 year.....	1,761,286	1,776,476	15,983	19,007
July .....	1,978,411	2,065,913	18,245	17,126
August .....	2,106,453	2,106,453	17,126	
September .....	21,007,802		185,173	
October .....				
November .....				
December .....				
Year .....				

\*These totals do not include charcoal pig iron. The 1934 production of this iron was 25,834 gross tons.  
†Included in pig iron figures.

## Merchant Iron Made, Daily Rate

	Tons				
	1936	1935	1934	1933	1932
January ....	10,537	3,926	7,800	2,602	6,256
February ....	6,288	7,071	2,863	7,251	7,157
March .....	7,089	7,197	1,908	5,287	4,658
April .....	8,799	8,838	4,088	6,090	3,329
May .....	8,441	9,099	7,756	3,070	3,213
June .....	7,874	9,499	8,634	4,286	4,435
July .....	8,644	7,880	8,358	3,674	
August .....	8,194	6,043			
September .....	10,090	4,986			
October .....	11,199	5,765			
November .....	12,503	6,610			
December ....	13,312	4,399			

## Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons)		February 1		January 1	
	January (31 Days)	December (30 Days)	Number in Blast	Operating Rate, Tons a Day	Number in Blast	Operating Rate, Tons a Day
<b>New York:</b>						
Buffalo .....	129,952	151,189	7	4,190	7	4,325
Other New York and Mass.	5,670	11,170	1	185	1	210
<b>Pennsylvania:</b>						
Lehigh Valley.....	37,655	38,124	3	1,215	3	1,230
Schuylkill Valley.....	20,044	21,724	2	645	2	700
Susquehanna and Lebanon Valleys .....	11,979	9,228	1	385	1	300
Ferromanganese .....	.....	.....	0	.....	0	.....
Pittsburgh District.....	381,370	386,383	19	11,005	21	12,075
Ferro. and Spiegel.....	10,203	9,864	3	450	2	320
Shenango Valley.....	20,815	35,654	1	630	2	1,150
Western Pennsylvania.....	64,176	42,645	4	2,070	3	1,375
Ferro. and Spiegel.....	6,382	4,262	1	205	1	135
Maryland .....	86,799	71,399	4	2,800	4	2,305
Wheeling District.....	135,033	148,410	7	4,355	7	4,790
<b>Ohio:</b>						
Mahoning Valley.....	211,482	208,047	10	6,820	10*	6,710
Central and Northern.....	183,873	219,087	10	5,930	11	6,540
Southern .....	30,262	42,885	4	975	4	1,385
Illinois and Indiana.....	412,090	425,231	19	12,870	20	14,075
Mich. and Minn.....	83,270	80,661	5	2,685	5	2,600
Colo., Mo. and Utah.....	19,547	20,563	2	630	2	665
<b>The South:</b>						
Virginia .....	.....	.....	0	.....	0	.....
Ferro. and Spiegel.....	3,019	2,990	1	95	1	95
Kentucky .....	13,378	14,223	1	430	1	460
Alabama .....	153,724	162,714	11	4,925	12	5,380
Ferromanganese .....	5,162	.....	1	165	0	.....
Tennessee .....	.....	.....	0	.....	0	.....
<b>Total .....</b>	<b>2,025,885</b>	<b>2,106,453</b>	<b>117</b>	<b>63,660</b>	<b>120*</b>	<b>66,825</b>

\*A Campbell furnace was blown in during December.

A circular recently issued by Botsfield Refractories Co., Swanson and Clymer Streets, Philadelphia, discusses Ada-Stic plastic insulating cement, a product added to its line in the past few months. Ada-Stic is said to be one of the most efficient insulations up to 2000 deg. F.; has guaranteed coverage; is reclaimable, can be applied by hand, trowel or cement spraying equipment; will adhere firmly to any clean surface; is tough and will stand up under hard usage and has practically no shrinkage.

The David L. Wilkoff Co. has established offices in the Koppers Building, Pittsburgh, to engage in the scrap iron and steel business. David L. Wilkoff, who for the past 10 years has been associated with United Iron & Metal Co., Pittsburgh, is president and treasurer of the new company. Mr. Wilkoff has been in the scrap business in Pittsburgh, with one year at Youngstown, since 1909. During five years of that period he headed his own company at Pittsburgh.



# Capital Goods Index Responds To Cold Weather Influences

**A** FURTHER decline in heavy industrial operations has lowered THE IRON AGE weekly capital goods activity index to an estimated 75.9 per cent of base-period "normal." The new reading compares unfavorably with all preceding weeks this year, but is approximately 12 per cent above the same period last year, 35 per cent above the corresponding week in 1934, and 98 per cent above the comparable 1933 level. On this basis, therefore, the index's present standard should give no cause for concern, although last week's figure represents the third

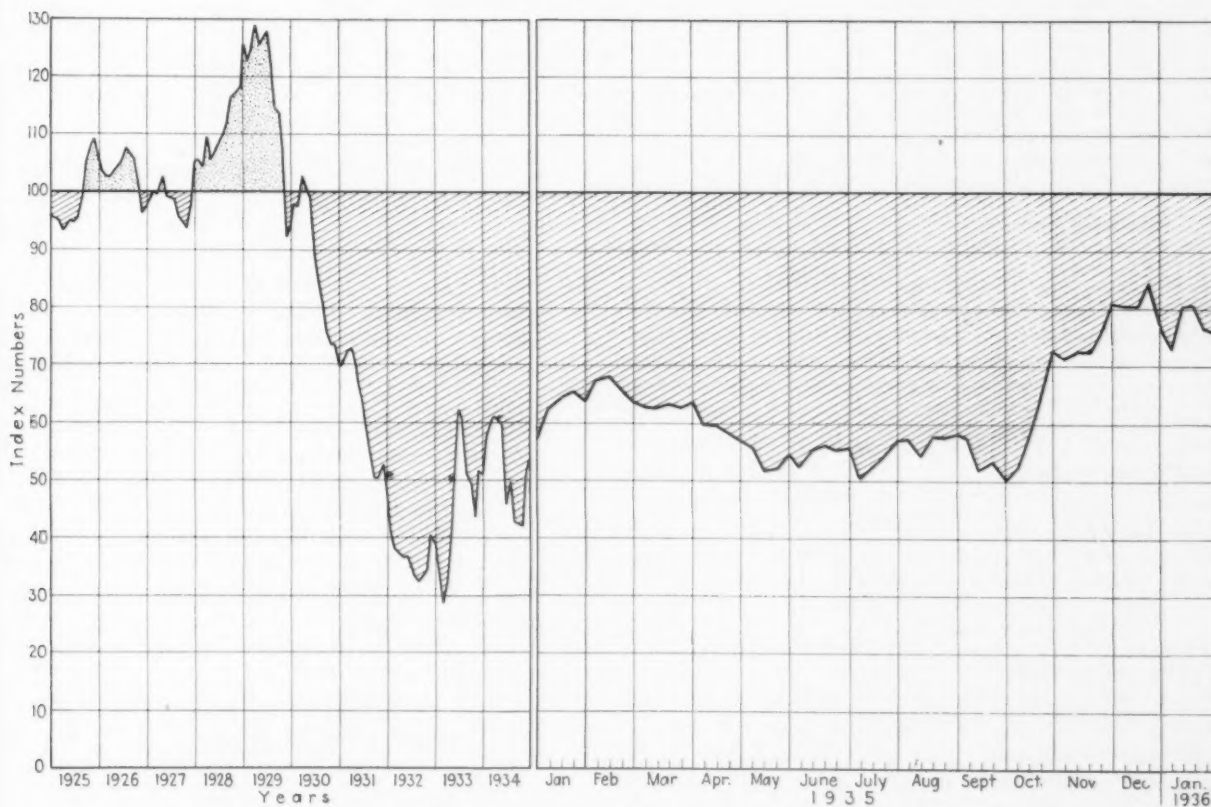
## The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-'27 Average = 100)

Last week (est.)	75.9
Preceding week (rev.)	76.6
Same week last month	76.5
Same week 1935	67.5
Same week 1934	56.2
Same week 1933	38.4
Same week 1932	42.8
Same week 1931	72.1
Same week 1930	96.8
Same week 1929	124.1

successive decline since the year opened.

Reductions occurred in all of the index's components, with the exception of that measuring building activity. The decline in the steel ingot rate was slight, despite the prevalence of cold weather; but at Pittsburgh shipments of industrial products have been noticeably curtailed by unfavorable weather. This factor has likewise slowed up the rate of retail automobile deliveries to a considerable extent, and, accordingly, motor car output has tapered downward a bit further.



(1925-27 Average = 100)

**The Iron Age Index of Capital Goods Activity.** The years 1925 to 1934 are plotted by months, by weeks since 1935.

Components of the index: Steel ingot production rate, from THE IRON AGE; revenue freight carloadings of forest products, from Association of American Railroads; automobile production from Cram's Automotive Reports; heavy construction contract awards, from Engineering News Record; index of productive activity in Pittsburgh district, from Bureau of Business Research of University of Pittsburgh.

# Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	December, 1935	November, 1935	December, 1934	Year 1934	Year 1935
<b>Raw Materials:</b>					
Lake ore consumption (gross tons) <sup>a</sup> .....	3,087,236	3,025,694	1,505,751	22,113,951	30,848,179
Coke production (net tons) <sup>b</sup> .....	3,488,818	3,217,175	2,501,441	31,821,576	35,209,240
<b>Pig Iron:</b>					
Pig iron output—monthly (gross tons) <sup>c</sup> .....	2,106,453	2,065,913	1,027,622	15,911,188	21,007,802
Pig iron output—daily (gross tons) <sup>c</sup> .....	67,950	68,864	33,149	43,592	57,556
<b>Castings:</b>					
Malleable castings—production (net tons) <sup>d</sup> .....		44,277	32,746	369,458	.....
Malleable castings—orders (net tons) <sup>d</sup> .....		47,778	36,505	354,146	.....
Steel castings—production (net tons) <sup>d</sup> .....		36,165	23,916	450,087	.....
Steel castings—orders (net tons) <sup>d</sup> .....		32,714	27,312	434,131	.....
<b>Steel Ingots:</b>					
Steel ingot production—monthly (gross tons) <sup>e</sup> ..	3,081,807	3,153,247	1,964,257	25,599,118	33,425,576
Steel ingot production—daily (gross tons) <sup>e</sup> .....	123,272	121,279	78,570	82,312	107,478
Steel ingot production—per cent of capacity <sup>e</sup> ..	55.68	54.78	35.68	37.38	48.55
<b>Employment in Steel Industry:</b>					
Total employees <sup>f</sup> .....		438,370	386,345	409,349	.....
Total payrolls (thousands of dollars) <sup>g</sup> .....		\$49,171	\$35,363	\$457,848	.....
Average hours worked per week <sup>g</sup> .....		35.7	27.4	30.4	.....
<b>Finished Steel:</b>					
Trackwork shipments (net tons) <sup>h</sup> .....	3,025	3,090	2,272	49,110	42,229
Sheet steel sales (net tons) <sup>i</sup> .....	203,318	289,101	193,130	1,830,682	2,473,489
Sheet steel production (net tons) <sup>j</sup> .....	208,774	224,541	159,740	1,895,460	2,424,990
Fabricated shape orders (net tons) <sup>k</sup> .....	96,235	92,775	67,799	1,054,382	1,068,603
Fabricated shape shipments (net tons) <sup>k</sup> .....	76,214	87,833	88,687	1,116,222	1,095,216
Fabricated plate orders (net tons) <sup>k</sup> .....	35,584	19,116	26,025	241,992	258,315
Reinforcing bar awards (net tons) <sup>k</sup> .....	29,025	11,475	12,661	182,351	318,340
U. S. Steel Corp. shipments (tons) <sup>l</sup> .....	661,515	681,820	418,630	5,925,873	7,371,299
Ohio River steel shipments (net tons) <sup>l</sup> .....	61,666	88,338	46,887	633,197	926,174
<b>Fabricated Products:</b>					
Automobile production, U. S. and Canada <sup>m</sup> .....	421,579	411,535	156,318	2,869,963	4,182,491
Construction contracts, 37 Eastern States <sup>n</sup> .....	\$264,136,500	\$188,115,000	\$92,694,900	\$1,543,108,400	\$1,844,544,900
Steel barrel shipments (number) <sup>d</sup> .....	541,370	634,396	424,233	6,682,400	6,872,452
Steel furniture shipments (dollars) <sup>d</sup> .....		\$1,591,286	\$1,090,171	\$11,807,843	.....
Steel boiler orders (sq. ft.) <sup>d</sup> .....	684,735	464,431	259,875	4,368,563	6,245,158
Locomotive orders (number) <sup>m</sup> .....	55	0	20	183	83
Freight car orders (number) <sup>m</sup> .....	10,571	25	1,532	24,611	18,699
Machine tool index <sup>o</sup> .....	98.3	98.6	66.1	†54.1	99.9
Foundry equipment index <sup>o</sup> .....	118.1	100.4	66.9	†67.5	119.5
<b>Foreign Trade:</b>					
Total iron and steel imports (gross tons) <sup>p</sup> .....		56,637	19,708	316,761	.....
Imports of pig iron (gross tons) <sup>p</sup> .....		15,550	3,642	115,470	.....
Imports of all rolled steel (gross tons) <sup>p</sup> .....		17,089	7,548	113,354	.....
Total iron and steel exports (gross tons) <sup>p</sup> .....	239,269	205,242	282,655	2,832,764	3,067,336
Exports of all rolled steel (gross tons) <sup>p</sup> .....		88,008	80,704	951,380	.....
Exports of finished steel (gross tons) <sup>p</sup> .....		68,324	78,137	833,559	.....
Exports of scrap (gross tons) <sup>p</sup> .....	148,380	104,961	196,361	1,835,554	2,107,814
<b>British Production:</b>					
British pig iron production (gross tons) <sup>r</sup> .....	559,300	525,100	513,500	5,978,500	6,422,000
British steel ingot production (gross tons) <sup>r</sup> .....	811,500	903,300	654,500	8,859,700	9,842,400
<b>Non-Ferrous Metals:</b>					
Lead production (net tons) <sup>s</sup> .....	42,020	39,957	37,217	412,298	421,764
Lead shipments (net tons) <sup>s</sup> .....	42,333	43,023	34,680	379,807	433,456
Zinc production (net tons) <sup>t</sup> .....	40,136	37,469	35,685	366,933	431,085
Zinc shipments (net tons) <sup>t</sup> .....	41,466	48,172	31,707	352,663	465,154
Deliveries of tin (gross tons) <sup>v</sup> .....	5,360	4,035	4,530	46,215	59,110

\*Preliminary. †Three months' average.

Source of figures: <sup>a</sup>Lake Superior Iron Ore Association; <sup>b</sup>Bureau of Mines; <sup>c</sup>THE IRON AGE; <sup>d</sup>Bureau of the Census; <sup>e</sup>American Iron and Steel Institute; <sup>f</sup>National Association of Flat-Rolled Steel Manufacturers; <sup>g</sup>American Institute of Steel Construction; <sup>h</sup>United States Steel Corp.; <sup>i</sup>United States Engineer, Pittsburgh; <sup>j</sup>When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; <sup>k</sup>F. W. Dodge Corp.; <sup>l</sup>Railway Age; <sup>m</sup>National Machine Tool Builders Association; <sup>n</sup>Foundry Equipment Manufacturers Association; <sup>o</sup>Department of Commerce; <sup>p</sup>British Iron and Steel Federation; <sup>q</sup>American Bureau of Metal Statistics; <sup>r</sup>American Zinc Institute, Inc.; <sup>s</sup>New York Commodities Exchange.

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## SUMMARY OF THIS WEEK'S BUSINESS

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# Railroad Orders Lift Steel Ingot Output To 52 Per Cent of Capacity

January Rail Purchases Totaled 214,500 Tons While Car Steel Releases  
Were Even Larger—Pig Iron Production Lower

**R**AILROAD buying is largely responsible for a 1½-point increase in steel ingot output this week which lifted production to 52 per cent of capacity, the highest level of the year. Production at Chicago, where orders for rails and freight car steel have been heaviest, advanced 6½ points to 59 per cent of capacity. The Wheeling and Ohio River districts recorded gains of four and eight points respectively, while output declined two points to 64 per cent at Cleveland and two points to 28 per cent at Buffalo. At Pittsburgh, Philadelphia, Birmingham, Detroit and in the Valleys, operations are unchanged.

Following the trend of ingot production during January, pig iron output last month declined 3.8 per cent, having averaged 65,351 tons daily. Only 117 stacks were making iron on Feb. 1, compared with 120 one month before, but in the Pittsburgh district the difficulty of securing water shipments of coal and coke by river because of ice may have influenced recent operations. Total January iron production was 2,025,885 tons, compared with 2,106,453 tons in December.

**T**HE real importance of railroad buying since the first of the year is indicated by the fact that rail orders during January totaled 214,500 tons while at least 75,000 tons is still pending, principally in the Chicago district. Chicago rail producers are booked through May 15 and the Birmingham mill has a backlog of 70,000 tons. Last week the Chicago & North Western ordered 35,000 tons of rails, bringing its recent purchases to 51,000 tons. The Atlantic Coast Line has placed 6000 tons. The New York Central is expected momentarily to close on 38,000 tons.

Railroad car steel has been an even more important outlet than rails and accessories. The Pennsylvania has placed more than 100,000 tons of plates, shapes, bars and sheets since the first of the year for freight car construction, and other large programs under way or soon to be undertaken will take an even larger tonnage in the aggregate. The Illinois Central has announced a repair program involving 4637 freight and 56 passenger cars.

**I**f long-delayed railroad buying is a conspicuous bright spot in the steel market, the indefinite outlook in the automotive industry is correspondingly drab. Unusually cold weather continues to depress

sales of both new and used cars and production has again declined. The slight spurt in steel specifications from the motor car builders which was noticed a week ago has subsided. At Cleveland, however, lack of automotive orders has been offset to some extent by business from refrigerator makers who are preparing for a heavy spring demand. Implement makers are also stepping up production in anticipation of increased orders.

The construction industry is severely handicapped by weather conditions, which are holding up shipments against old contracts. The week's fabricated structural steel awards totaled 16,400 tons, compared with 28,700 tons in the previous week, while new projects call for 11,350 tons.

**T**HE finished steel price structure, which has been weakened by recent sharp concessions on certain products, is not yet believed to be seriously threatened. In most instances, products sold through jobbers are most seriously affected, the price variations can usually be traced to a more widely accepted policy on the part of mills to set up established buying differentials for distributors. This explanation applies in the case of reinforcing bars, wire nails, galvanized sheets and pipe. However, butt-weld pipe, up to and including 3-in. material, has been reduced from \$3 to \$4 a ton by the granting of an extra 5 per cent discount to jobbers.

The larger steel producers have by no means abandoned their efforts to advance semi-finished steel prices on all shipments after Feb. 15. This increase of \$1 to \$2 a ton was expected to have become effective Jan. 1, but the date has been advanced twice. Some sales have already been made at the higher levels and mills are determined to secure the new quotations in order to establish a basis for increased finished steel prices later in the year.

Scrap prices are higher in practically all centers because of the inability of dealers to make shipments from icebound yards. THE IRON AGE scrap composite has risen to \$13.67 a ton because of an advance in heavy melting steel at Chicago. The composite price of finished steel has declined from 2.130c. a lb. to 2.109c. a lb. because of lower pipe quotations. The pig iron composite is unchanged at \$18.84 a ton.



# A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous:  
Advances Over Past Week in Heavy Type, Declines in Italics

## Pig Iron

	Feb. 4, 1936	Jan. 28, 1936	Jan. 7, 1936	Feb. 5, 1935
<i>Per Gross Ton:</i>				
No. 2 fdy., Philadelphia.....	\$21.3132	\$21.3132	\$21.3132	\$20.26
No. 2, Valley furnace.....	19.50	19.50	19.50	18.50
No. 2 Southern, Cin'tl.....	20.2007	20.2007	20.2007	19.13
No. 2, Birmingham†.....	15.50	15.50	15.50	14.50
No. 2 foundry, Chicago*.....	19.50	19.50	19.50	18.50
Basic, del'd eastern Pa.....	20.8132	20.8132	20.8132	19.76
Basic, Valley furnace.....	19.00	19.00	19.00	18.00
Malleable, Chicago*.....	19.50	19.50	19.50	18.50
Malleable, Valley.....	19.50	19.50	19.50	18.50
L. S. charcoal, Chicago.....	25.2528	25.2528	25.2528	24.04
Ferromanganese, seab'd car- lots .....	75.00	75.00	75.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

\*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

## Rails, Billets, etc.

<i>Per Gross Ton:</i>				
Rails, heavy, at mill.....	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2
Light rails, Pittsburgh.....	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh..	29.00	29.00	29.00	27.00
Sheet bars, Pittsburgh.....	30.00	30.00	30.00	28.00
Slabs, Pittsburgh.....	29.00	29.00	29.00	27.00
Forging billets, Pittsburgh...	35.00	35.00	35.00	32.00
Wire rods, Pittsburgh.....	40.00	40.00	40.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb....	1.80	1.80	1.80	1.70

## Finished Steel

<i>Per Lb.:</i>	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.85	1.85	1.85	1.80
Bars, Chicago.....	1.90	1.90	1.90	1.85
Bars, Cleveland.....	1.90	1.90	1.90	1.85
Bars, New York.....	2.20	2.20	2.20	2.13
Tank plates, Pittsburgh.....	1.80	1.80	1.80	1.80
Tank plates, Chicago.....	1.85	1.85	1.85	1.85
Tank plates, New York.....	2.09	2.09	2.09	2.08
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago...	1.85	1.85	1.85	1.85
Structural shapes, New York...	2.06 1/4	2.06 1/4	2.06 1/4	2.05 1/4
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh...	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

## Finished Steel

	Feb. 4, 1936	Jan. 28, 1936	Jan. 7, 1936	Feb. 5, 1935
<i>Per Lb.:</i>	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24 Gary.....	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh...	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary...	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh.....	2.40	2.40	2.40	2.60
Wire nails, Chicago dist. mill	2.45	2.45	2.45	2.65
Plain wire, Pittsburgh.....	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., P'gh.....	2.80	2.80	2.80	3.00
Barbed wire, galv., Chicago dist. mill.....	2.85	2.85	2.85	3.05
Tin plate, 100 lb. box, P'gh...	\$5.25	\$5.25	\$5.25	\$5.25

## Scrap

<i>Per Gross Ton:</i>				
Heavy melting steel, P'gh...	\$14.50	\$14.50	\$14.25	\$13.25
Heavy melting steel, Phila...	12.75	12.75	12.50	11.75
Heavy melting steel, Ch'go...	13.75	13.50	13.25	11.50
Carwheels, Chicago.....	13.00	13.00	13.25	12.00
Carwheels, Philadelphia.....	14.75	14.75	13.00	12.50
No. 1 cast, Pittsburgh.....	14.25	14.25	14.25	13.75
No. 1 cast, Philadelphia.....	13.00	13.00	13.00	11.00
No. 1 cast, Ch'go (net ton)...	12.00	12.00	12.00	10.00
No. 1 RR. wrot., Phila.....	13.25	13.25	12.25	11.25
No. 1 RR. wrot., Ch'go (net)...	12.00	11.00	11.00	10.00

## Coke, Connellsville

<i>Per Net Ton at Oven:</i>				
Furnace coke, prompt.....	\$3.65	\$3.65	\$3.65	\$3.85
Foundry coke, prompt.....	4.25	4.25	4.25	4.60

## Metals

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Electrolytic copper, Conn....	9.25	9.25	9.25	8.75
Lake copper, New York.....	9.37 1/2	9.37 1/2	9.37 1/2	9.12 1/2
Tin (Straits), New York.....	48.00	46.30	46.87 1/2	51.15
Zinc, East St. Louis.....	4.85	4.85	4.85	3.70
Zinc, New York.....	5.22 1/2	5.22 1/2	5.22 1/2	4.05
Lead, St. Louis.....	4.35	4.35	4.35	3.35
Lead, New York.....	4.50	4.50	4.50	3.50
Antimony (Asiatic), N. Y....	12.87 1/2	12.62 1/2	13.75	14.50

# The Iron Age Composite Prices

## Finished Steel

Feb. 4, 1936	2.109c. a Lb.
One week ago	2.130c.
One month ago	2.130c.
One year ago	2.124c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.

## Pig Iron

\$18.84 a Gross Ton
18.84
18.84
17.90

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

## Steel Scrap

\$13.67 a Gross Ton
13.58
13.33
12.17

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	Low	HIGH	Low	HIGH	Low
1935 .....	2.130c., Oct. 1;	2.124c., Jan. 8	\$18.84, Nov. 5;	\$17.83, May 14	\$13.42, Dec. 10;	\$10.33, April 23
1934 .....	2.199c., April 24;	2.008c., Jan. 2	17.90, May 1;	16.90, Jan. 27	13.00, Mar. 13;	9.50, Sept. 25
1933 .....	2.015c., Oct. 3;	1.867c., April 18	16.90, Dec. 5;	13.56, Jan. 3	12.25, Aug. 8;	6.75, Jan. 3
1932 .....	1.977c., Oct. 4;	1.926c., Feb. 2	14.81, Jan. 5;	13.56, Dec. 6	8.50, Jan. 12;	6.43, July 5
1931 .....	2.037c., Jan. 13;	1.945c., Dec. 29	15.90, Jan. 6;	14.79, Dec. 15	11.33, Jan. 6;	8.50, Dec. 29
1930 .....	2.273c., Jan. 7;	2.018c., Dec. 9	18.21, Jan. 7;	15.90, Dec. 16	15.00, Feb. 18;	11.25, Dec. 9
1929 .....	2.317c., April 2;	2.273c., Oct. 29	18.71, May 14;	18.21, Dec. 17	17.58, Jan. 29;	14.08, Dec. 3
1928 .....	2.286c., Dec. 11;	2.217c., July 17	18.59, Nov. 27;	17.04, July 24	16.50, Dec. 31;	13.08, July 2
1927 .....	2.402c., Jan. 4;	2.212c., Nov. 1	19.71, Jan. 4;	17.54, Nov. 1	15.25, Jan. 11;	13.08, Nov. 22

# Wheeling District Steel Output Is Advanced



Production Unchanged In Pittsburgh and Valley Areas Despite Adverse Weather Conditions—Price Test on Steel Products Promised

PITTSBURGH, Feb. 4.—Total steel bookings for January reflected a less drastic drop from December business than had been expected in the face of record-breaking low temperatures and a slump in automotive steel demand. The cold weather has been a brake on the movement of flat-rolled and structural steel going into construction projects.

At the outset of February, aggregate demand seems to have leveled off, but, at the same time, shows no signs of early recession. Producers in this district are expecting February business to increase at least 10 per cent over January. Based upon promise of railroad car orders and increased automobile activity later in the month. The most encouraging aspect, however, of the immediate market is the diversified character of incoming steel orders. Steel mill activity has been hampered somewhat by lack of fuel, owing to freezing over of local waterways. Notwithstanding the adverse factors here, Pittsburgh steel ingot production this week is well sustained at 36 per cent of capacity, as is production in the Valleys and nearby northern Ohio mills at 60 per cent. Output in the Wheeling district has increased four points to about 74 per cent.

The early behavior of finished steel prices, which are becoming increasingly subject to concessions in certain areas, depends largely upon whether the higher quotations nominally effected on semi-finished grades last fall will be rigidly established on Feb. 15, the deadline presumably set for semi-finished shipments against old low-priced contracts.

## Pig Iron

January deliveries fell considerably below those for December. The well-bought position of consumers at the close of the year and extreme cold weather were the prime retarding factors. Shipments by water in this district are still stymied by frozen waterways. Melt at some ingot mold plants is increasing. Prices remain firm.

A large portion of mill equipment makers' requirements still is being handled on reciprocal arrangements.

## Semi-Finished Steel

Feb. 15 seems generally to be the deadline for shipments against old low-priced contracts. Whether that deadline will be rigidly observed is purely a matter of conjecture. Few non-integrated mills are anticipating the higher quotations by unusually heavy specifications. At the same time, semi-finished producers are not pressing solicitation of shipping releases. In the non-integrated group, the contention that higher semi-finished prices should not prevail until some adjustment is made in finished steel quotations is being strongly stressed. A clarification of the price situation before Feb. 15 seems to be in the wind.

## Bars

Deliveries in January failed by a small margin to match those in December. The drop is clearly attributable to the falling off in automobile orders. This loss has not been offset yet by an increasing amount of business from railroad car builders, who are, however, releasing shipments more frequently against orders allocated in this district. The volume of such business is expected to play an important part in fulfilling producers' forecasts of at least 10 per cent heavier volume in February than last month. Unsettlement in prices has not been overcome in some areas, with Detroit still the most vulnerable spot for concessions.

## Bolts, Nuts and Rivets

Important producers in this district report small gains in January business over December tonnage. Orders placed by car builders late in January were chiefly responsible for the upturn. Demand from the automobile industry has waned, but there is some expectation of increased interest this month. Prices in the

immediate Pittsburgh vicinity are being well held, but the same can not be said for some districts farther inland.

## Reinforcing Steel

Although specifications received in January showed an improvement over those for December, shipments did not enjoy the same record owing to the extremely cold weather during the latter half of January. Production at some mills also was hampered by sub-zero temperatures. Bids will be opened Feb. 11 at the Kansas City Engineer Office for about 1600 tons for the Fort Peck dam project at Wiota, Mont. Prices in some distributors' markets have practically got out of hand owing to the severe competition for Government business, which has attracted all classes of so-called jobbers.

## Cold-Finished Bars

This market is entering a quiet spell after a month of fairly satisfactory shipments against low-priced contracts, which generally were completed on Jan. 31. The 2.10c. Pittsburgh base will apply to all shipments for the remainder of second quarter. Weakness in hot-rolled bar quotations in one district is exerting an unsettling effect on the cold-finished bar market. Although the 2.10c. price represents a \$3 a ton advance, this increase has been offset in some measure by a relative reduction in chemical composition extras. Production this week probably will drop about 10 points to around 50 per cent of capacity. Automobile tonnage has declined sharply, while demand from other sources is relatively stable.

## Plates and Shapes

The recent freeze on the Ohio, Monongahela and Allegheny Rivers has halted the barge market temporarily. The Pittsburgh Coal Co. barge inquiry, involving about 1500 tons, still pends, while one or two other small craft are being figured. Repair work is at a minimum. Plates for railroad car building are being ordered out a little faster, but the volume of such releases is still relatively small.

The fabricated structural steel market reflects no important trend, activity still being centered in public works projects of usual tonnage proportions. Private jobs are scattered. Fresh inquiries reported here are featured by 2000 tons for a school in New York, and 1000 tons for Trico Products Corp'n. factory addition at Buffalo.

The margin between plain struc-

tural and fabricated structural material has narrowed drastically. Fabricated steel figures being bid against public work jobs represent sharp concessions in almost every instance. Open disturbances in the mill base for plain material are not apparent.

### Tubular Goods

A steady demand for oil-country goods is the balance-wheel in this market. Movement of standard pipe has been affected adversely by severe weather conditions hampering construction projects, while reduced activity in the automotive industry has depressed mechanical tubing tonnage. The railroads are sporadic in their placements of orders for boiler tubes, which for industrial purposes are relatively quiet. Little or no disturbance in prices is perceptible in most grades of pipe, although butt-weld has been reduced by the granting of an extra five per cent discount to jobbers.

### Sheet Steel Piling

Bids were opened Jan. 31 by the Tennessee Valley Authority covering 6000 to 7600 tons for the Gunterville and Chickamauga dams, requisitions GD 5 and CD 4. Prices bid on new piling were similar; with only one or two bids for second hand material on a small portion of the tonnage having been received. Delivered prices at Sheffield and Hobbs Island, Ala., were \$2.71 per 100 lb. for plain and \$4.21 for fabricated piling. Delivered quotations at Chattanooga were \$2.67 for plain and \$4.17 for fabricated material.

### Wire Products

Demand has leveled off. Shipments of manufacturers' wire to the automotive industry are in a

marked slump, but to other industrial consumers the movement is fairly steady. Interest from the farm areas is too concentrated in the South to be encouraging, although recent weather conditions and legislative developments are clearly the stumbling blocks in the way of a vigorous demand. Resale markets in the Pittsburgh area are firm, but other districts leave a good deal to be desired, particularly respecting wire nails. Bidding for Government requirements has been a notably depressing factor.

### Sheets

Despite a tapering in automotive tonnage and in the face of recent severe weather, sheet bookings in January reflected a less drastic drop from that in December than had been expected. Miscellaneous business in the past week was the backbone of the market and is the dominant influence in sustaining sheet operations this week at around 65 per cent of capacity. The price structure shows increasing evidence of instability. A possible exception is in hot-rolled sheets. The weakness, which originally centered in the Detroit area, has spread to other districts.

### Tin Plate

Virtually no change in activity or demand is perceptible in this market. Average output for the tin plate industry in the current week will hold at 60 per cent of capacity. General line can manufacturing requirements are accounting for a goodly share of current movement, while production is partly sustained by orders for future vegetable and fruit packing requirements. Stocks in mill warehouses have not been noticeably reduced.

### Strip Steel

Reduced demand in this market is a reflection of the recession in automotive centers. Some mills which are operating on extremely thin backlogs are curtailing hot-rolled production this week, with a result that average output probably will fall about five points to 40 per cent of capacity.

### Coal and Coke

A veritable shortage of coal in the mid-West, notably in Ohio, Indiana, Michigan and Iowa, has stimulated a relatively active domestic fuel market in West Virginia and western Pennsylvania fields. The strong demand for lump coal has sponsored a rise of 25c. to 35c. in prices for that grade at West Virginia mines. Other supporting influences are an extreme car shortage and difficult shipping conditions.

### Scrap

Mills continue to restrict scrap purchases, with only a small tonnage of No. 1 heavy melting steel having been sold during the past week at the going quotation of \$14.75, delivered, Pittsburgh district. Despite the meager consumer interest, bidding for the Pennsylvania Railroad scrap, totaling 28,000 tons, is expected to be highly competitive, since available supplies are none too plentiful and railroad steel for the moment represents the only assured source for satisfying immediate requirements. A fairly substantial short interest in this market is evident, and brokers still are experiencing difficulty in covering profitably against unfilled orders. More favorable weather conditions probably will release a little more scrap than has been appearing during the past fortnight of freezing weather.

## Weekly Indications of Steel Activity

### From THE IRON AGE

					Average Year to Date	
	Feb. 4, 1936	Jan. 28, 1936	Jan. 7, 1936	Feb. 5, 1935	1936	1935
Steel ingot operations—Per cent of capacity	52.0	50.5	51.0	56.5	50.7	50.3
	Week Ended				Year to Date	
	Feb. 4, 1936	Jan. 28, 1936	Jan. 7, 1936	Feb. 5, 1935	1936	1935
Fabricated structural steel awards.....	16,400	28,970	13,650	16,600	96,970	85,000
Fabricated plate awards.....	0	875	12,112	1,390	46,022	41,675
Sheet steel piling awards.....	0	0	0	0	3,600	4,300
Reinforcing bar awards.....	3,735	27,460	2,750	3,850	65,945	36,400



## Girdler Addresses A.M.A. on Personnel Problems

"PROSPERITY, to be real, must be based upon understanding and cooperation, not upon paternalism and class warfare," said Tom M. Girdler, chairman and president of Republic Steel Corp., in an address by him on Feb. 5 at Palmer House, Chicago. Mr. Girdler appeared before the American Management Association conference on industrial relations.

"No problem," declared the speaker, "is more basic nor more important to present day efficient management than that of a proper handling of industrial relations. You cannot run a mill or a factory successfully if employee-employer relation policies are misguided. The very heart of an efficiently operated business lies in mutual confidence between the employee and the employer.

"A great deal of talk goes around about what the worker wants. We hear this from labor leaders, politicians, social workers and writers. We have heard about class struggles and all sorts of phrases that may be all right for college professors who get paid for using big words and phrases. Much against our better judgment, we of management who were actually under the same roof with our workers, listened and even accepted at times the immature and badly formed opinions of these outsiders. A more sensible method has always been at hand and whenever we use it, we couldn't go wrong. That method is to go directly to our own men and to discuss frankly, honestly, and above board our mutual problems. When enterprises were small, that was the natural procedure. As industrial organizations grew larger we lost that direct contact. That must be regained, and it has been regained, by those companies and industries where the employees have adopted employee representation plans.

"Through these plans employees are enabled freely to determine exactly whom they want to represent them in presenting their point of view. And let me say here that if it is important that the employees' problems be presented to the company, it is equally important that the company's problems in matters pertaining to employment and wages be set before the employees. Management and men must understand each others problems if there

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is to be any balance in industrial relation."

Discussing frequent but unsuccessful attempts by professional labor leaders to unionize the steel industry, Mr. Girdler attributed the failure of such efforts to the intelligence and common sense of the workers.

"Our workers know the steel business," he said. "They know that we are doing the best we can for them in the present circumstances.

They know that if they allow the labor politicians into the steel industry, the effect will be only to disturb an industry which is just beginning to get back on its feet. The workers are cooperating with management to put that industry back on its feet. The workers, as well as employees, distrust these labor politicians because their objective is never to increase productivity; their objective is only to increase the number of dues-paying members of their unions."

# Railroad Business Boosts Chicago Production Sharply



Ingot Output Advances  $6\frac{1}{2}$  Points  
To 59 Per Cent of Capacity—Rail  
Inquiries Still Pending Call For  
75,000 Tons

**C**HICAGO, Feb. 4.—The growing importance of railroad business is strongly reflected in this week's ingot output which has jumped  $6\frac{1}{2}$  points to 59 per cent of capacity. The Chicago & Northwestern has ordered 51,000 tons of rails in the last 10 days and other Western railroads are prepared to enter the market for 75,000 tons.

Notwithstanding continuance of extreme winter weather, rail releases are now coming in fast and mills are well scheduled to the middle of May. Car repair work is gaining ground and there are several attractive equipment inquiries now before the trade. Another bright picture is afforded by farm implement manufacturers who are stepping up production in order to meet spring demand.

The wants of automobile builders continue to taper and there is spot-tiness in the miscellaneous trade. However, this is confined to buying and specifications as all indications point to a level rate of operations in miscellaneous metal consuming shops. Fabricators are rather discouraged as to the immediate outlook, but there is some promise of betterment in their line when the weather modifies and is more favorable for outdoor construction.

The heating and ventilating show held here last week was attended by large crowds which showed extreme interest in air conditioning. This promises to afford another growing outlet for sheet mill products. It is reported here that General Motors is going into the air-conditioning field on a very broad scale.

## Pig Iron

Heavy sales and shipments late last year are still influencing this market. The melt, however, remains at a satisfactory level, all things considered. Automobile foundries in western Michigan expect February to be the low month of the first half of 1936. They claim to see a good first half and are counting on the bonus to move both used and new cars.

## Reinforcing Bars

Continued cold weather is taking additional toll from the reinforcing bar market. Private projects certainly are hibernating and only on forced-work undertakings by means of public money are attempts being made to outwit the weather man. Curtailed shipments are forcing shop operations to new low levels. The price situation is one which is of deep concern to mills for their base prices are threatened and there must either be quick tightening or a general drop to lower prices for reinforcing bars.

## Cast Iron Pipe

Shipments have begun to suffer because of the protracted cold spell which has put two feet or more of frost in the ground. WPA work goes ahead regardless of cost but contractors, being anxious to show profits, are holding back. Current buying is limited to small lots but some large tonnages are in the making and they should enliven the early spring market. Less talk is now heard about price advances, but quotations remain strong.

## Wire Products

Unfavorable weather is still considered by the trade to be a factor in holding business at a standstill at a time when increasing tonnage can usually be expected. However, the picture as a whole is satisfying from the viewpoint that January movement was ahead of the corresponding month a year ago and that January business did not drop in proportion to the comparatively heavy December. Sellers generally looked for a slow January following an active December. The AAA is about as completely forgotten as is the NRA and developments thus far have thrown no great fear into the minds of wire producers. Demand from automobile centers continues to taper and the general opinion is that revival will not take place until some time in March.

## Bars

The influence of automobile demand is keenly felt by bar mills. Specifications during January con-

tinued to slide from the December rate and the outlook is that February releases from that source will drop still farther. It is probable that severe weather has pushed automobile sales lower than they would otherwise have been during the last three weeks. Agricultural implement schedules continue to climb as manufacturers start to prepare their own as well as dealers' stocks for spring demand. Miscellaneous use remains fairly steady and road machinery builders should soon broaden their demands on the basis of favorable reports from the Cleveland show.

## Plates

The promise of the railroads entering this market on a broader scale improves as each week passes. There are now numerous lots of 100 to 200 cars, each on which either heavy repairs are going forward or which will soon enter railroad shops, and interest in new equipment is spreading. Legal matters in which Columbia Gas & Electric Corp. was involved have been cleared away and extension of a natural gas line to Detroit is a step nearer.

## Rails

The Chicago & North Western has ordered 35,000 tons of rails from Carnegie-Illinois, bringing its total purchases within the last 10 days to 51,000 tons, which is far heavier than the tonnage taken by this railroad last year. Other Western lines are nibbling for rails that aggregate 75,000 tons, some of which will probably be purchased within the week.

## Structural Material

Lists of jobs that are being estimated are getting shorter, and most fabricating shops are curtailing operations. Government jobs and road work in particular have turned very light and private work is limited in scope. Wisconsin Steel Co., Chicago, will use 1500 tons for new mill buildings and the only other private project of note is for 500 tons for a bakery at Omaha, Neb.

## Sheets

Now the miscellaneous trade is following the lead of automobile manufacturers and is taking lighter quantities of sheets. A contrary movement is under way among agricultural implement manufacturers who are expanding production schedules. Tin plate, though not in heavy demand, is steady.

## Scrap

The undertone of this market remains very strong and heavy melting steel is quotable at \$13.50 to \$14. There has been some specula-



tion regarding a possible reaction in prices should the weather moderate but opinion leans strongly in favor of other factors such as continued strong demand from mills and the fact that the visible supply of first grades now within easy reach of Chicago would be inadequate with an upturn in demand of as much as 15 to 20 per cent above present levels. There is rather general agreement that consumers will draw heavier against available supplies by the time March comes around.

## Railroad Equipment

Illinois Central will repair 141 locomotives, 4637 freight cars and 56 passenger cars, 52 of the latter to be air-conditioned.

Cornwall Railroad is in the market for 20 70-ton ore cars.

Burlington has ordered two six-car Zephyr trains from E. G. Budd Mfg. Co. These will supplement overtaxed facilities of two three-car Zephyr trains now in service between Chicago and the Twin Cities.

### RAILS

Chicago & North Western has ordered 35,000 tons of rails from Carnegie-Illinois Steel Corp. This is in addition to 16,000 tons placed last week with Inland Steel Co.

Atlantic Coast Line has ordered 6000 tons of rails from Tennessee Coal, Iron & Railroad Co.

Gulf, Mobile & Northern is in the market for 3000 tons of rails.

## Birmingham Rail Mill Started Up

BIRMINGHAM, Feb. 4. — The Ensley rail mill resumed production on Monday, after having been inactive since Jan. 1, and will probably continue to operate steadily for several months. Last week the Atlantic Coast Line Railroad announced that it had ordered 6000 tons of rails from the Tennessee Coal, Iron & Railroad Co. Gulf, Mobile & Northern Railroad is expected to buy 3000 tons. Rail orders reported in January amounted to 46,600 tons, in addition to several thousand tons of accessories. It is likely that other unannounced tonnage has also been booked. Estimates of the rail backlog now on hand range around 70,000 tons.

Preparatory to the resumption of the Ensley mill, the Tennessee company blew in another blast furnace, Ensley No. 1, on Jan. 27 and fired three Ensley open-hearth on Jan. 30.

Twelve blast furnaces are operating. The Tennessee company is running six, Woodward Iron Co., two; Republic Steel Corp., two; and Sloss-Sheffield Steel & Iron Co., two. Four are on basic, six on foundry.

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ings in time and labor. Uses 200 different accessories. Weighs 12 ounces. Fastest and most powerful portable tool for its weight and type ever developed. Price \$18.50, complete with 6 Chicago Mounted Wheels.

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dry, one on recarburizing metal and one on ferromanganese.

Last week open-hearth operations ranged from 11 to 14. This week 14 will operate, seven being at Fairfield, three at Ensley and four at Alabama City.

New pig iron business is rather light, on account of previous buying. Shipments are at a fair rate. January shipments did not equal those of December.

Demand for heavy steel, such as

bars, plates and shapes is increasing. The cold weather of the past 10 days has affected demand for sheets and wire products from the country markets.

Pressure pipe business is maintaining the fourth quarter rate. New tonnage booked in January was on a par with the three preceding months. PWA orders are being placed regularly and these will continue for several months. Plant operations average around three to four days per week. Last week op-





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erations were reduced on account of snow and bad weather.

Field work has started on Birmingham's \$5,800,000 industrial water system. Col. A. C. Polk has been appointed engineer in charge. This week bids will be asked on the first lot of pipe, amounting to approximately 2000 tons of 16 and 24-in. cast iron pipe for branch lines.

## Steel Output Again Declines at Buffalo

**B**UFFALO, Feb. 4.—Open hearth operations have again dwindled with Republic Steel Corp'n. using but two furnaces. Bethlehem's Lackawanna plant continues to operate nine and Wickwire-Spencer Steel Corp'n. one. Seneca sheet division of Bethlehem is operating at 90 per cent, with experimental rolling still proceeding in Bethlehem's new sheet and strip plant.

Bids will be taken February 7 by Trico Products Corp'n., for its new addition to require 500 to 600 tons of structural steel. Under Con-

tract No. 3, now adopted by the city of Niagara Falls, the new sewage disposal plant will require 400 tons of structural steel and about 200 tons of reinforcing bars. There will be some bars in the Trico plant, but probably less than 100 tons. The pipe industry will get business out of the replacement in East Aurora, N. Y., of wooden water mains, and plans are being prepared for extension of the Niagara Falls water system to Youngstown and Lewiston, N. Y., following favorable referendums in both villages.

Not as much pig iron was sold during January as in January of last year, but this was expected in view of the unusually heavy December bookings. Shipments are up to expectations and indicate increasing business among foundries.

Outside scrap markets are lively, but in Buffalo prices are unchanged. While materials is apparently not being shipped out of this city, nothing is coming in from immediately adjacent sources. Some material is going to Youngstown. No sales of importance were noted during the past week.

## Boston Export Scrap Prices Advance

**B**OSTON, Feb. 4.—With supplies diminishing because of the continued export movement and the protracted cold weather which has slowed up yard operations, shippers have been forced to advance prices on certain kinds of scrap to obtain cargoes. For No. 2 steel as high as \$9.50 a ton, delivered army base, was paid last week, as high as \$10.50 for No. 1 steel and small rail tonnages, and as high as \$8.25 for No. 2 cast. These prices represent an advance of 25c. a ton. Efforts by local exporters to buy from Providence disclose that exporters at the latter port can obtain as high or higher prices as at Boston.

Two steamers are loading at Boston, one with 3000 tons for Italy, and the other with 7300 tons, presumably for the same country. Present plans call for a boat to begin loading a round tonnage at Providence about Feb. 10. With the American Steel & Wire Co. now out of the market, New England consumers' demands are limited to small tonnages of machinery cast. The market for Pittsburgh delivery is flat.

The feature of the pig iron market is the announcement that the Mystic Iron Works will start up its furnace on or about April 1 following a shutdown of more than four years. Current pig iron buying is in small lots, mostly truckloads. The average New England foundry, based on current operations, is well covered through the first quarter.

Cold weather has slowed up construction and cast iron pipe activities.

The Boston & Maine Railroad's Billerica, Mass., locomotive shops will continue to operate this month employing 650 men; the Concord, N. H., passenger repair shops, 106, and the Keene, N. H., motor car repair shops, about 70.

Data relating to oil storage tank design and construction are given in technical bulletin No. 11, 25 pages, issued by the Chicago Bridge & Iron Works, Chicago. Joint efficiencies and tables of standard capacity tanks for the storage of oil and other liquids are included, as well as a wealth of useful information such as tables giving circumference, area and volume of circles and cylinders, weights of steel plates and sheets, dimensions of standard and line pipe, and other data.

# Prices of Finished Steel and Iron Products

## BARS, PLATES, SHAPES

### Iron and Steel Bars

Soft Steel		Base per Lb.
F.o.b. Pittsburgh	.....	1.85c.
F.o.b. Chicago	.....	1.90c.
F.o.b. Gary	.....	1.90c.
F.o.b. Duluth	.....	2.00c.
F.o.b. Detroit	.....	2.00c.
F.o.b. Cleveland	.....	1.90c.
F.o.b. Buffalo	.....	1.95c.
F.o.b. Philadelphia	.....	2.10c.
F.o.b. New York	.....	2.20c.
F.o.b. Birmingham	.....	2.00c.
F.o.b. cars dock Gulf ports	.....	2.25c.
F.o.b. cars dock Pacific ports	.....	2.40c.

### Rail Steel

(For merchant trade)		
F.o.b. Pittsburgh	.....	1.70c.
F.o.b. Chicago	.....	1.75c.
F.o.b. Gary	.....	1.75c.
F.o.b. Moline, Ill.	.....	1.75c.
F.o.b. Cleveland	.....	1.75c.
F.o.b. Buffalo	.....	1.80c.
F.o.b. Birmingham	.....	1.85c.
F.o.b. cars dock Gulf ports	.....	2.10c.
F.o.b. cars dock Pacific ports	.....	2.25c.

### Billet Steel Reinforcing

(Straight lengths as quoted by distributors)		
F.o.b. Pittsburgh	.....	2.05c.
F.o.b. Chicago	.....	2.10c.
F.o.b. Gary	.....	2.10c.
F.o.b. Detroit	.....	2.20c.
F.o.b. Cleveland	.....	2.20c.
F.o.b. Youngstown	.....	2.10c.
F.o.b. Buffalo	.....	2.10c.
F.o.b. Birmingham	.....	2.10c.
F.o.b. cars dock Gulf ports	.....	2.45c.
F.o.b. cars dock Pacific ports	.....	2.45c.

### Rail Steel Reinforcing

(Straight lengths as quoted by distributors)		
F.o.b. Pittsburgh	.....	1.90c.
F.o.b. Chicago	.....	1.95c.
F.o.b. Gary	.....	1.95c.
F.o.b. Cleveland	.....	1.95c.
F.o.b. Youngstown	.....	1.95c.
F.o.b. Buffalo	.....	1.95c.
F.o.b. Birmingham	.....	1.95c.
F.o.b. cars dock Gulf ports	.....	2.30c.
F.o.b. cars dock Pacific ports	.....	2.30c.

### Iron

F.o.b. Chicago	.....	1.80c.
F.o.b. Pittsburgh (refined)	.....	2.10c.
Delivered New York	.....	2.05c.
Delivered Philadelphia	.....	2.10c.

### Cold Finished Bars and Shafting\*

Base per Lb.		
F.o.b. Pittsburgh	.....	2.10c.
F.o.b. Chicago	.....	2.15c.
F.o.b. Gary	.....	2.15c.
F.o.b. Cleveland	.....	2.15c.
F.o.b. Buffalo	.....	2.15c.
F.o.b. Detroit	.....	2.30c.
F.o.b. eastern Michigan	.....	2.35c.

\* In quantities of 10,000 to 19,999 lb.

### Fence and Sign Posts

#### Angle Line Posts

Base per Net Ton		
F.o.b. Pittsburgh	.....	\$54.00
F.o.b. Chicago	.....	54.00
F.o.b. Duluth	.....	55.00
F.o.b. Cleveland	.....	54.00
F.o.b. Birmingham	.....	57.00
F.o.b. Houston, Orange, Beaumont, Galveston	.....	63.00
F.o.b. Mobile	.....	62.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	.....	63.00
F.o.b. cars dock Pacific ports	.....	67.00

### Plates

Base per Lb.		
F.o.b. Pittsburgh	.....	1.80c.
F.o.b. Chicago	.....	1.85c.
F.o.b. Gary	.....	1.85c.
F.o.b. Cleveland	.....	1.95c.
F.o.b. Coatesville	.....	1.90c.
F.o.b. Sparrows Point	.....	1.90c.
F.o.b. Philadelphia	.....	1.90c.
F.o.b. New York	.....	2.09c.
F.o.b. Birmingham	.....	1.95c.
F.o.b. cars dock Gulf ports	.....	2.20c.
F.o.b. cars dock Pacific ports	.....	2.35c.
Wrought iron plates, f.o.b. P'gh.	.....	3.20c.

### Floor Plates

F.o.b. Pittsburgh	.....	3.35c.
F.o.b. Chicago	.....	3.40c.
F.o.b. Coatesville	.....	3.45c.
F.o.b. cars dock Gulf ports	.....	3.75c.
F.o.b. cars dock Pacific ports	.....	3.90c.

### Structural Shapes

Base per Lb.		
F.o.b. Pittsburgh	.....	1.80c.
F.o.b. Chicago	.....	1.85c.
F.o.b. Cleveland	.....	1.95c.
F.o.b. Buffalo	.....	1.90c.
F.o.b. Bethlehem	.....	1.90c.
F.o.b. Philadelphia	.....	2.015c.
F.o.b. New York	.....	2.025c.
F.o.b. Birmingham (standard)	.....	1.95c.
F.o.b. cars dock Gulf ports	.....	2.20c.
F.o.b. cars dock Pacific ports	.....	2.35c.

## Steel Sheet Piling

Base per Lb.		
F.o.b. Pittsburgh	.....	2.15c.
F.o.b. Chicago	.....	2.25c.
F.o.b. Buffalo	.....	2.25c.
F.o.b. cars dock Gulf ports	.....	2.60c.
F.o.b. cars dock Pacific ports	.....	2.60c.

## SHEETS, STRIP, TIN PLATE

### Hot Rolled

Base per Lb.		
No. 10, f.o.b. Pittsburgh	.....	1.85c.
No. 10, f.o.b. Gary	.....	1.95c.
No. 10, del'd Detroit	.....	2.05c.
No. 10, del'd Phila.	.....	2.10c.
No. 10, f.o.b. Birmingham	.....	2.00c.
No. 10, f.o.b. cars dock Pacific ports	.....	2.40c.

### Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	.....	2.40c.
No. 24, f.o.b. Gary	.....	2.50c.
No. 24, del'd Detroit	.....	2.45c.
No. 24, del'd Phila.	.....	2.71c.
No. 24, f.o.b. Birmingham	.....	2.55c.
No. 24, f.o.b. cars dock Pacific ports	.....	3.05c.
No. 24, wrought iron, Pittsburgh	.....	4.30c.

### Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	.....	2.50c.
No. 10 gage, f.o.b. Gary	.....	2.60c.
No. 10 gage, del'd Detroit	.....	3.00c.
No. 10 gage, del'd Phila.	.....	2.81c.
No. 10 gage, f.o.b. Birmingham	.....	2.65c.
No. 10 gage, f.o.b. cars dock Pacific ports	.....	3.10c.

### Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	.....	2.95c.
No. 20 gage, f.o.b. Gary	.....	3.05c.
No. 20 gage, del'd Detroit	.....	3.15c.
No. 20 gage, del'd Phila.	.....	3.26c.
No. 20 gage, f.o.b. Birmingham	.....	3.10c.
No. 20 gage, f.o.b. cars dock Pacific ports	.....	3.50c.

### Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	.....	3.10c.
No. 24, f.o.b. Gary	.....	3.20c.
No. 24, del'd Phila.	.....	3.41c.
No. 24, f.o.b. Birmingham	.....	3.25c.
No. 24, f.o.b. cars dock Pacific ports	.....	3.70c.
No. 24, wrought iron, Pittsburgh	.....	4.95c.

### Long Termes

No. 24, unassorted 8-lb. coating	.....	3.40c.
F.o.b. Gary	.....	3.50c.
F.o.b. cars dock Pacific ports	.....	4.10c.

### Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	.....	3.10c.
No. 20, f.o.b. Gary	.....	3.20c.
No. 20, f.o.b. Birmingham	.....	3.70c.
No. 20, f.o.b. cars dock Pacific ports	.....	3.70c.
No. 10, f.o.b. Pittsburgh	.....	2.50c.
No. 10, f.o.b. Gary	.....	2.60c.
No. 10, f.o.b. Birmingham	.....	3.10c.
No. 10, f.o.b. cars dock Pacific ports	.....	3.10c.

### Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	.....	2.75c.
No. 28, Gary	.....	2.85c.
No. 28, cars dock Pacific Coast	.....	3.35c.

### Tin Plate

Per Base Box		
Standard cokes, f.o.b. P'gh district mill	.....	\$5.25
Standard cokes, f.o.b. Gary	.....	5.35
Standard cokes, f.o.b. cars dock Pacific ports	.....	5.90

### Terne Plate

(F.o.b. Pittsburgh)		
(Per Package, 20 x 28 in.)		
8-lb. coating I.C.	.....	\$10.00
15-lb. coating I.C.	.....	12.00
20-lb. coating I.C.	.....	13.00
25-lb. coating I.C.	.....	14.00
30-lb. coating I.C.	.....	15.25
40-lb. coating I.C.	.....	17.50

### Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.

Base per Lb.		
All widths up to 24 in., P'gh.	.....	1.85c.
All widths up to 24 in., Chicago	.....	1.95c.
All widths up to 24 in., del'd Detroit	.....	2.05c.
All widths up to 24 in., Birmingham	.....	2.00c.
Cooperage stock, Pittsburgh	.....	1.95c.
Cooperage stock, Chicago	.....	2.05c.

### Cold-Rolled Strips

Base per Lb.		
F.o.b. Pittsburgh	.....	2.60c.
F.o.b. Cleveland	.....	2.60c.
Del'd Chicago	.....	2.895c.
F.o.b. Worcester	.....	2.80c.

### Fender Stock

No. 14, Pittsburgh or Cleveland	.....	2.90c.
No. 14, Worcester	.....	3.30c.
No. 20, Pittsburgh or Cleveland	.....	3.30c.
No. 20, Worcester	.....	3.70c.

## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

### To Manufacturing Trade Per Lb.

Bright wire	.....	2.30c.
Spring wire	.....	2.90c.

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

### To the Trade

Base per Keg		
Standard wire nails	.....	\$2.40
Smooth coated nails	.....	2.40

### Base per 100 Lb.

Annealed fence wire	.....	\$2.45
Galvanized fence wire	.....	2.80
Polished staples	.....	3.10
Galvanized staples	.....	3.35
Barbed wire, galvanized	.....	2.80
Twisted barless wire	.....	2.80
Woven wire fence, base column	.....	31.00
Single loop bale ties, base column	.....	33.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth, which is \$3 over Pittsburgh), and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh, while Pacific Coast prices are \$8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are \$11 a ton above Pittsburgh.

On staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

## Wire Hoops, Twisted or Welded

Off List		
F.o.b. Pittsburgh	.....	45 off
F.o.b. Chicago	.....	43 1/2 off

## STEEL AND WROUGHT IRON PIPE AND TUBING

### Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills  
F.o.b. Pittsburgh only on wrought iron pipe.

### Butt Weld

Steel		Wrought Iron	
Inches	Black Galv.	Inches	Black Galv.
1/4	..... 51 1/2 29 1/2	1/4	..... 91 1/2 138
1/2	..... 53 1/2 35	1/2	..... 93 1/2 141 1/2
3/4	..... 58 1/2 47	3/4	..... 98 1/2 150 1/2
1	..... 62 1/2 52	1	..... 103 1/2 160 1/2
1 1/4	..... 64 1/2 55	1 1/4	..... 109 1/2 170 1/2
1 1/2	..... 65 1/2 56	1 1/2	..... 111 1/2 173 1/2
2	..... 68 1/2 59	2	..... 116 1/2 180 1/2
2 1/2	..... 71 1/2 62	2 1/2	..... 121 1/2 190 1/2
3	..... 74 1/2 65	3	..... 126 1/2 200 1/2
3 1/2	..... 77 1/2 68	3 1/2	..... 131 1/2 210 1/2
4	..... 80 1/2 71	4	..... 136 1/2 220 1/2
4 1/2	..... 83 1/2 74	4 1/2	..... 141 1/2 230 1/2
5	..... 86 1/2 77	5	..... 146 1/2 240 1/2
5 1/2	..... 89 1/2 80	5 1/2	..... 151 1/2 250 1/2
6	..... 92 1/2 83	6	..... 156 1/2 260 1/2
6 1/2	..... 95 1/2 86	6 1/2	..... 161 1/2 270 1/2
7	..... 98 1/2 89	7	..... 166 1/2 280 1/2
7 1/2	..... 101 1/2 92	7 1/2	..... 171 1/2 290 1/2
8	..... 104 1/2 95	8	..... 176 1/2 300 1/2
8 1/2	..... 107 1/2 98	8 1/2	..... 181 1/2 310 1/2
9	..... 110 1/2 101	9	..... 186 1/2 320 1/2
9 1/2	..... 113 1/2 104	9 1/2	..... 191 1/2 330 1/2
10	..... 116 1/2 107	10	..... 196 1/2 340 1/2
10 1/2	..... 119 1/2 110	10 1/2	..... 201 1/2 350 1/2
11	..... 122 1/2 113	11	..... 206 1/2 360 1/2
11 1/2	..... 125 1/2 116	11 1/2	..... 211 1/2 370 1/2
12	..... 128 1/2 119	12	..... 216 1/2 380 1/2
12 1/2	..... 131 1/2 122	12 1/2	..... 221 1/2 390 1/2
13	..... 134 1/2 125	13	..... 226 1/2 400 1/2
13 1/2	..... 137 1/2 128	13 1/2	..... 231 1/2 410 1/2
14	..... 140 1/2 131	14	..... 236 1/2 420 1/2
14 1/2	..... 143 1/2 134	14 1/2	..... 241 1/2 430 1/2
15	..... 146 1/2 137	15	..... 246 1/2 440 1/2
15 1/2	..... 149 1/2 140	15 1/2	..... 251 1/2 450 1/2
16	..... 152 1/2 143	16	..... 256 1/2 460 1/2
16 1/2	..... 155 1/2 146	16 1/2	..... 261 1/2 470 1/2
17	..... 158 1/2 149	17	..... 266 1/2 480 1/2
17 1/2	..... 161 1/2 152	17 1/2	..... 271 1/2 490 1/2
18	..... 164 1/2 155	18	..... 276 1/2 500 1/2
18 1/2	..... 167 1/2 158	18 1/2	..... 281 1/2 510 1/2
19	..... 170 1/2 161	19	..... 286 1/2 5



## BOLTS, NUTS, RIVETS AND SET SCREWS

**Bolts and Nuts**  
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

*Per Cent Off List*

Machine and carriage bolts:	
1/2 in. x 6 in. and smaller:	.70, 10 and 5
Larger than 1/2 in.:	.70 and 10
Lag bolts:	.70 and 10
Low bolts, Nos. 1, 2, 3 and 7	
heads:	.70 and 10
Hot-pressed nuts, blank or tapped,	
square:	.70 and 10
Hot-pressed nuts, blank or tapped, hexa-	
gon:	.70 and 10
C.n.c. and hex. square or hex. nuts, blank	
or tapped:	.70 and 10
Semi-finished hexagon nuts, U.S.S. and	
S.A.E., all sizes to and incl.	
1 in. diameter:	.60, 20 and 15
Larger than 1 in. diameter:	.60, 20 and 15
Stove bolts in packages, Pittsburgh:	.72 1/2 and 10
Stove bolts in packages, Chicago:	.72 1/2 and 10
Stove bolts in packages, Cleveland:	.72 1/2 and 10
Stove bolts in bulk, Pittsburgh:	.82 1/2
Stove bolts in bulk, Chicago:	.82 1/2
Stove bolts in bulk, Cleveland:	.82 1/2
Tire bolts:	.55

**Large Rivets**  
(1/2-in. and larger)

*Base per 100 Lb.*

F.o.b. Pittsburgh or Cleveland:	\$2.90
F.o.b. Chicago:	3.00
F.o.b. Birmingham:	3.05

**Small Rivets**  
(7/16-in. and smaller)

*Per Cent Off List*

F.o.b. Pittsburgh:	.70 and 5
F.o.b. Cleveland:	.70 and 5
F.o.b. Chicago and Birmingham:	.70 and 5

**Cap and Set Screws**  
(Weight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

*Per Cent Off List*

Milled cap screws, 1 in. dia. and	
smaller:	.80, 10 and 10
Milled standard set screws, case hard-	
ened, 1 in. dia. and smaller:	.75
Milled headless set screws, cut thread	
1/2 in. and smaller:	.75
Unset hex. head cap screws, U.S.S. or	
S.A.E. thread, 1 in. and smaller:	.85
Unset set screws, cut and oval	
points:	.75 and 10
Milled studs:	.65 to 65 and 10

## Alloy and Stainless Steel

**Alloy Steel Ingots**

F.o.b. Pittsburgh, Chicago, Canton,	
Massillon, Buffalo, Bethlehem,	
Unrefined:	\$.40 per gross ton

**Alloy Steel Blooms, Billets and Slabs**

F.o.b. Pittsburgh, Chicago, Canton,	
Massillon, Buffalo, Bethlehem,	
Base price, \$49 a gross ton.	

**Alloy Steel Bars**

Price del'd Detroit is \$52.

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base: \$2.45c.

Delivered price at Detroit is: \$2.60c.

S.A.E. Alloy

Series Differential

per 100 lb.

2000 (1/2% Nickel)	\$.25
2100 (2 1/4% Nickel)	0.35
2300 (3 1/4% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel, base	
6100 Chromium Vanadium Bar:	1.10c.
6100 Chromium Vanadium Spring Steel	1.10c.
Chromium Nickel Vanadium	1.40
Carbon Vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars 1/4c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

**Alloy Cold-Finished Bars**  
F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo. 2.95c. base per lb.

**STAINLESS STEEL No. 302**  
(17 to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)  
(Base Prices f.o.b. Pittsburgh)

*Per Lb.*

Forging billets:	19.55c.
Bars:	23c.
Plates:	26c.
Structural shapes:	23c.
Sheets:	33c.
Hot-rolled strip:	20 1/4c.
Cold-rolled strip:	27c.
Drawn wire:	23c.

## Raw and Semi-Finished Steel

### Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

*Per Gross Ton*

Rerolling:	\$29.00
Forging quality:	35.00

### Delivered Detroit

Rerolling:	\$32.00
Forging:	38.00

### Billets Only F.o.b. Duluth

Rerolling:	\$31.00
Forging:	37.00

### Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

*Per Gross Ton*

Open-hearth or Bessemer:	\$30.00
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### Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

*Per Lb.*

Grooved:	1.80c.
Universal:	1.80c.
Sheared:	1.80c.

### Wire Rods (Common, base)

*Per Gross Ton*

F.o.b. Pittsburgh:	\$40.00
F.o.b. Cleveland:	40.00
F.o.b. Chicago:	41.00
F.o.b. Anderson, Ind.:	41.00
F.o.b. Youngstown:	41.00
F.o.b. Worcester, Mass.:	42.00
F.o.b. Birmingham:	43.00
F.o.b. San Francisco:	49.00
F.o.b. Galveston:	46.00

## Pig Iron and Ferroalloys

### PIG IRON

#### PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	\$20.50	\$21.00	\$20.00	\$21.50
Bethlehem, Pa.	20.50	21.00	20.00	21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Swedeland, Pa.	20.50	21.00	20.00	21.50
Steelton, Pa.	20.50	21.00	20.00	21.50
Sparrows Point, Md.	19.50	19.50	19.00	20.00
Neville Island, Pa.	19.50	19.50	19.00	20.00
Sharpville, Pa.	19.50	19.50	19.00	20.00
Youngstown	19.50	19.50	19.00	20.00
Buffalo	19.50	20.00	18.50	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Cleveland	19.50	19.50	19.00	20.00
Toledo, Ohio	19.50	19.50	19.00	20.00
Jackson, Ohio	21.25	21.25	20.75	22.25
Detroit	19.50	19.50	19.00	20.00
Hamilton, Ohio	19.50	19.50	19.00	20.00
Chicago	19.50	19.50	19.00	20.00
Granite City, Ill.	19.50	19.50	19.00	20.00
Duluth, Minn.	20.00	20.00	20.50	21.50
Birmingham	15.50	15.50	14.50	20.00
Provo, Utah	17.50	17.50	17.00	18.50

#### DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	\$21.00	\$21.50	\$20.50	\$22.00
Brooklyn				
From East, Pa.	22.9289	23.4289	22.9289	23.4289
Newark or Jersey City, N. J.	21.9873	22.4873	21.4873	22.9873
From East, Pa.	21.9873	22.4873	21.4873	22.9873
Philadelphia	21.3132	21.8132	20.8132	22.3132
Cincinnati	20.5807	20.5807	20.0807	21.0807
From Hamilton, Ohio	20.5807	20.5807	20.0807	21.0807
From Cleveland and Youngstown	20.8482	20.8482	20.3482	21.3482
Columbus, Ohio	21.64	21.64	21.14	22.14
From Hamilton, Ohio	21.64	21.64	21.14	22.14
Mansfield, Ohio	21.3832	21.3832	20.8832	21.8832
From Cleveland and Toledo	21.3832	21.3832	20.8832	21.8832
Indianapolis	21.9289	21.9289	21.4289	22.4289
From Hamilton, Ohio	21.9289	21.9289	21.4289	22.4289
South Bend, Ind.	21.6935	21.6935	21.1935	22.1935
From Chicago	21.6935	21.6935	21.1935	22.1935
Milwaukee	20.57	20.57	20.07	21.07
From Chicago	20.57	20.57	20.07	21.07
St. Paul	21.94	21.94	21.44	22.44
From Duluth	21.94	21.94	21.44	22.44
Davenport, Iowa	21.3832	21.3832	20.8832	21.8832
From Chicago	21.3832	21.3832	20.8832	21.8832
Kansas City	22.2178	22.2178	21.7178	22.7178
From Granite City	22.2178	22.2178	21.7178	22.7178
San Francisco, Los Angeles or Seattle. From Provo	22.315	22.315	21.815	22.815

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

### LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. \$24.00

### GRAY FORCE PIG IRON

Valley furnace:	\$19.00
Pittsburgh district furnace:	19.00

### CHARCOAL PIG IRON

Lake Superior furnace:	\$22.00
Delivered Chicago:	25.2528
Delivered Buffalo:	25.595

## CANADA

### Pig Iron

*Per gross ton:*

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75:	\$21.00
No. 2 fdy., sil. 1.75 to 2.75:	20.50
Malleable:	22.50

*Delivered Montreal*

No. 1 fdy., sil. 2.25 to 2.75:	\$22.50
No. 2 fdy., sil. 1.75 to 2.25:	22.00
Malleable:	22.50
Basic:	22.00

## FERROALLOYS

### Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

*Per Gross Ton*

Domestic, 80% (carload):	\$75.00
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### Spiegeleisen

*Per Gross Ton Furnace*

Domestic, 19 to 21%:	\$26.00
50-ton lots 3-mo. shipment:	24.00
F.o.b. New Orleans:	26.00

### Electric Ferrosilicon

*Per Gross Ton Delivered*

50% (carloads):	\$77.50
50% (ton lots):	85.00
75% (carloads):	126.00
75% (ton lots):	136.00

### Silvery Iron

F.o.b. Jackson, Ohio, Furnace

	Per Gross Ton	Per Gross Ton
6.00 to 6.50%	\$22.75	12% \$29.75
6.51 to 7.00%	23.25	13% 30.75
7.01 to 7.50%	23.75	14% 31.75
7.51 to 8.00%	24.25	15% 32.75
8.01 to 8.50%	24.75	16% 33.75
8.51 to 9.00%	25.25	17% 34.75
9.01 to 9.50%	25.75	
9.51 to 10.00%	26.25	
10.01 to 10.50%	26.75	
10.51 to 11.00%	27.25	
11.01 to 11.50%	27.75	
11.51 to 12.00%	28.25	

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson. Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

### Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

	Per Gross Ton	Per Gross Ton
10.00 to 10.50%	\$27.75	13% \$31.75
10.51 to 11.00%	28.15	14% 32.25
11.01 to 11.50%	28.75	15% 32.75
11.51 to 12.00%	29.25	16% 33.25
12%:	30.25	17% 33.75

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

### Other Ferroalloys

Ferrotungsten, per lb. contained W, del., carloads:	\$1.30
Ferrotungsten, lots of 5000 lb.:	1.40
Ferrotungsten, smaller lots:	1.45
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in car loads:	10.00c.
Ferrocromium, 2% carbon:	16.50c. to 17.00c.
Ferrocromium, 1% carbon:	17.50c. to 18.00c.
Ferrocromium, 0.10% carbon:	19.50c. to 20.00c.
Ferrocromium, 0.06% carbon:	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V:	\$2.70 to \$2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	\$2.50
Ferrocobalt, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton:	\$137.50
Ferrocobalt, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton:	142.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18% with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton:	58.50
Ferrophosphorus, electric, 24% in carloads, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo. del.	95c.
Calcium molybdate, per lb. Mo. del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads:	\$38.00
Ton lots or less, per ton:	45.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade:	85.00
2% carbon grade:	90.00
1% carbon grade:	100.00
Spot prices:	\$5 a ton higher



# Iron and Steel Scrap

## PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$14.25 to \$14.75
No. 2 heavy melting steel	13.00 to 13.50
No. 2 railroad wrought	14.25 to 14.75
Scrap rails	14.50 to 15.00
Ball, 3 ft. and under	15.50 to 16.00
Compressed sheet steel	14.25 to 14.75
Hand bundled sheet steel	13.00 to 13.50
Hvy. steel axle turnings	12.75 to 13.25
Machine shop turnings	10.00 to 10.50
Short shov. turnings	10.00 to 10.50
Short mixed borings and turnings	8.50 to 9.50
Cast iron borings	8.50 to 9.50
Cast iron car wheels	14.00 to 14.50
Heavy breakable cast	12.50 to 13.00
No. 1 cast	14.00 to 14.50
Rail, knuckles and couplers	16.50 to 17.00
Roll and leaf springs	16.50 to 17.00
Roll and steel wheels	16.50 to 17.00
Low phos. billet crops	16.75 to 17.25
Low phos. sheet bar crops	16.50 to 17.00
Low phos. punchings	16.00 to 16.50
Low phos. plate scrap	15.25 to 15.75
Steel car axles	15.00 to 15.50

## CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	\$13.50 to \$14.00
Automobile hvy. melt steel	11.50 to 12.00
Shoveling steel	13.50 to 14.00
Hydraulic comp. sheets	12.75 to 13.25
Drop forge flashings	10.75 to 11.25
No. 1 busheling	12.50 to 13.00
Roll and car wheels	14.25 to 14.75
Railroad leaf springs	14.00 to 14.50
Steel turnings	12.50 to 13.00
Steel couplers and knuckles	14.50 to 15.00
Roll and springs	15.00 to 15.50
Atle turnings (elec. fur.)	13.25 to 13.75
Low phos. punchings	14.75 to 15.25
Low phos. plates, 12 in. and under	15.50 to 16.00
Cast iron borings	6.50 to 7.00
Short shoveling turnings	7.50 to 8.00
Machine shop turnings	6.50 to 7.00
Rolling rails	14.75 to 15.25
Steel rails, less than 3 ft.	15.00 to 15.50
Steel rails, less than 2 ft.	16.25 to 16.75
Angle bars, steel	11.75 to 12.25
Cast iron car wheels	13.00 to 13.50
Railroad malleable	16.00 to 16.50
Agricultural malleable	14.50 to 15.00

	Per Net Ton
Iron car axles	\$16.00 to \$16.50
Steel car axles	14.50 to 15.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.75 to 12.25
No. 2 busheling, old	6.50 to 7.00
Locomotive tires, smooth	12.00 to 12.50
Pipes and flues	7.00 to 7.50
No. 1 machinery cast	12.00 to 12.50
Clean automobile cast	11.00 to 11.50
No. 1 railroad cast	10.75 to 11.25
No. 1 agricultural cast	10.25 to 10.75
Stove plate	8.50 to 9.00
Grate bars	8.50 to 9.00
Brake shoes	9.00 to 9.50

## PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$12.50 to \$13.00
No. 2 heavy melting steel	11.25 to 11.75
Hydraulic compressed, new	12.00 to 12.50
Hydraulic compressed, old	9.50 to 10.00
Steel rails for rolling	14.50 to 15.00
Cast iron car wheels	14.50 to 15.00
Heavy breakable cast	12.00 to 12.50
No. 1 cast	13.00 to 13.50
Stove plate (steel works)	10.00 to 10.50
Railroad malleable	16.00 to 16.50
Machine shop turnings	7.75 to 8.25
No. 1 blast furnace	6.25
Cast borings	6.00
Heavy axle turnings	10.25 to 10.75
No. 1 low phos. heavy	15.00 to 15.50
Couplers and knuckles	15.75 to 16.25
Roll and steel wheels	15.75 to 16.25
Steel axles	16.50 to 17.00
Shafting	18.25 to 18.75
No. 1 railroad wrought	13.00 to 13.50
Sec. iron and steel pipe	10.00 to 10.50
Bundled sheets	11.00 to 11.50
No. 1 forge fire	11.50 to 12.00
Cast borings (chem.)	10.50 to 13.00

## CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$11.00 to \$11.50
No. 2 heavy melting steel	9.00 to 9.50
Scrap rails for melting	10.50 to 11.00
Loose sheet clippings	7.00 to 7.50
Bundled sheets	8.00 to 8.50
Cast iron borings	6.00 to 6.50
Machine shop turnings	6.75 to 7.25
No. 1 busheling	8.50 to 9.00
No. 2 busheling	4.25 to 4.75
Rails for rolling	11.00 to 11.50
No. 1 locomotive tires	9.50 to 10.00
Short rails	14.00 to 14.50
Cast iron car wheels	10.50 to 11.00
No. 1 machinery cast	11.50 to 12.00
No. 1 railroad cast	10.75 to 11.25
Stove plate	7.75 to 8.25
Agricultural malleable	9.75 to 10.25
Railroad malleable	11.50 to 12.00

## CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$13.25 to \$13.75
No. 2 heavy melting steel	12.25 to 12.75
Compressed sheet steel	12.75 to 13.00
Light bundled sheet stampings	9.75 to 10.25
Drop forge flashings	12.00 to 12.50
Machine shop turnings	7.75 to 8.25
Short shoveling turnings	8.75 to 9.00
No. 1 busheling	12.00 to 12.50
Steel axle turnings	10.75 to 11.25
Low phos. billet crops	16.50 to 17.00
Cast iron borings	8.75 to 9.00
Mixed borings and short turnings	8.75 to 9.00
No. 2 busheling	8.75 to 9.00
No. 1 cast	14.50 to 15.00
Railroad grate bars	8.00 to 8.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	16.50 to 17.00
Rails for rolling	15.50 to 16.00
Railroad malleable	16.50 to 17.00
Cast iron car wheels	12.75 to 13.00

## BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	\$12.25 to \$12.75
No. 2 heavy melting steel	11.25 to 11.75
Scrap rails	12.25 to 12.75
New hydraulic, comp. sheets	11.25 to 11.75
Old hydraulic, comp. sheets	9.25 to 9.75
Drop forge flashings	11.25 to 11.75
No. 1 busheling	11.25 to 11.75
Hvy. steel axle turnings	10.50 to 11.00
Machine shop turnings	6.50 to 7.00
Knuckles and couplers	13.50 to 14.00
Roll and leaf springs	13.50 to 14.00
Roll and steel wheels	13.50 to 14.00
Low phos. billet crops	14.50 to 15.00
Short shov. steel turnings	7.75 to 8.25
Short mixed borings and turnings	7.75 to 8.25
Cast iron borings	7.75 to 8.25
No. 2 busheling	7.00 to 7.50
Steel car axles	12.50 to 13.00
Iron axles	12.50 to 13.00
No. 1 machinery cast	12.50 to 13.00
No. 1 cupola cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Steel rails, 3 ft. and under	14.50 to 15.00
Cast iron car wheels	12.00 to 12.50
Railroad malleable	15.00 to 15.50
Chemical borings	9.00 to 9.50

## BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$10.25 to \$10.50
No. 1 heavy melting steel	9.75
Scrap rails	10.25 to 10.50
Scrap rails	8.00 to 8.25
No. 2 steel	9.25 to 9.50
No. 2 steel	8.75
Breakable cast	6.75 to 7.00
Machine shop turnings	5.50 to 5.75
Machine shop turnings	3.40 to 3.75
Bundled skeleton, long	6.75 to 7.15
Shafting	13.00 to 13.25
Engine blocks, stripped	8.00 to 8.25
Iron borings, chemical	5.00 to 7.00
Cotton ties	5.50 to 6.00
Stove plate	7.00

Per gross ton delivered consumers' yards:

Textile cast	\$8.50 to \$10.00
No. 1 machinery cast	8.50 to 10.50
Stove plate	6.50 to 7.00

\* Delivered local army base.

## NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$9.00 to \$9.50
No. 2 heavy melting steel	8.00 to 8.50
Heavy breakable cast	7.00 to 7.50
No. 1 machinery cast	8.00 to 8.50
No. 2 cast	7.50 to 7.75
Stove plate	16.75 to 17.00
Steel car axles	13.50 to 14.00
Shafting	13.50 to 13.75
No. 1 railroad wrought	8.50 to 9.00
No. 1 yard wrought long	7.50 to 8.00
Snee. iron and steel pipe	6.00 to 6.50
Forge fire	6.50 to 7.00
Rails for rolling	9.50 to 10.50
Short shoveling turnings	3.50 to 4.00
Machine shop turnings	4.00 to 4.50
Cast borings	3.00 to 3.50
No. 1 blast furnace	3.00 to 3.50
Cast borings (chemical)	10.00 to 11.00
Unprepared yard iron and steel	4.50 to 5.00

Per gross ton, delivered local foundries:

No. 1 machinery cast	\$11.00
No. 1 hvy. cast (size)	9.50
No. 2 cast	8.00

† Loading on barge.  
\* 50c. higher offered at nearby New Jersey points.

## BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	\$9.50 to \$10.00
Scrap steel rails	11.00 to 11.50
Short shoveling turnings	7.00
Stove plates	7.00
Steel axles	11.50 to 12.00
Iron axles	11.50
No. 1 railroad wrought	8.50
Rails for rolling	12.50
No. 1 cast	10.50 to 11.00
Tramcar wheels	10.00 to 10.50

## ST. LOUIS

Dealers' buying prices per gross ton delivered consumers' works:

Selected heavy steel	\$11.50 to \$12.00
No. 1 heavy melting	11.50 to 12.00
No. 2 heavy melting	9.50 to 10.00
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	11.75 to 12.25
Railroad springs	12.00 to 12.50
Bundled sheets	7.50 to 8.00
No. 2 railroad wrought	11.50 to 12.00
No. 1 busheling	6.50 to 7.00
Cast iron borings and shoveling turnings	4.50 to 5.00
Rails for rolling	12.50 to 13.00
Machine shop turnings	4.00 to 4.50
Heavy turnings	9.00 to 9.50
Steel car axles	12.50 to 13.00
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	10.00 to 10.50
Steel rails less than 3 ft.	13.50 to 14.00
Steel angle bars	12.50 to 13.00
Cast iron car wheels	10.50 to 11.00
No. 1 machinery cast	11.25 to 11.50
Railroad malleable	13.75 to 14.25
No. 1 railroad cast	10.50 to 11.00
Stove plate	7.50 to 8.00
Agricult. malleable	11.75 to 12.25

## DETROIT

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$10.50 to \$11.00
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## ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

### Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.50% iron	\$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

### Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron dry Spanish or Algeria	10.25c.
Iron, low phos., Swedish, average 68 1/2% iron	10.25c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	25c.
Manganese, African, Indian, 49-51%	26c.
Manganese, Brazilian, 46 to 48 1/2%	24c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered	\$15.75 to \$16.00
Tungsten, domestic, scheelite delivered	15.75 to 16.00

Per Gross Ton

Chrome, 45% Cr <sub>2</sub> O <sub>3</sub> , lamp, c.i.f.	
Atlantic Seaboard (African)	\$17.50
45 to 46% Cr <sub>2</sub> O <sub>3</sub> (Turkish)	
48% Cr <sub>2</sub> O <sub>3</sub> (African)	20.50
48% min. Cr <sub>2</sub> O <sub>3</sub> (Turkish)	19.25
Chrome concentrate, 50% and over Cr <sub>2</sub> O <sub>3</sub> , c.i.f. Atlantic Seaboard	22.00
52% Cr <sub>2</sub> O <sub>3</sub> (Turkish)	21.75
48 to 49% Cr <sub>2</sub> O <sub>3</sub> (Turkish)	19.25

### Fluorspar

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all rail shipment	\$16.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	17.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	18.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	20.00
Domestic No. 1 ground bulk, 5 to 98% calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines	30.00

## COKE, COAL AND FUEL OIL

### Coke

Per Net Ton

Furnace, f.o.b. Connellsville Prompt	\$3.65 to \$3.80
Foundry, f.o.b. Connellsville Prompt	4.25 to 5.75
Foundry, by-product, Chicago ovens, for delivery outside switching district	9.00
Foundry, by-product, delivery in Chicago switching district	9.75
Foundry, by-product, New England, delivered	11.50
Foundry, by-product, Newark or Jersey City, del'd	9.65
Foundry, by-product, Phila. Foundry, by-product, Cleveland, delivered	9.75
Foundry, by-product, Cincinnati, del'd	9.50

No. 2 heavy melting steel	\$9.50 to \$9.75
Borings and short turnings	6.00 to 6.50
Long turnings	6.00 to 6.50
No. 1 machinery cast	13.50 to 14.00
Automotive cast	13.50 to 14.00
Hydraulic comp. sheets	11.00 to 11.50
Stove plate	8.75 to 9.25
New factory busheling	9.75 to 10.25
Old No. 2 busheling	5.25 to 5.75
Sheet clippings	8.00 to 8.50
Flashings	9.75 to 10.25
Low phos. plate scrap	10.25 to 10.75

## CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	\$8.00	\$7.50
Rails, scrap	8.50	8.00
Machine shop turnings	3.50	3.50
Boiler plate	5.00	5.00
Heavy axle turnings	4.50	4.00
Cast borings	4.50	4.00
Steel borings	3.00	3.00
Wrought pipe	4.00	4.00
Steel axles	8.00	8.50
Axles, wrought iron	8.00	8.50
No. 1 machinery cast	9.50	9.00
Stove plate	6.50	6.00
Standard car wheels	7.75	7.00
Malleable	7.50	7.00

Foundry, Birmingham	\$6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

### Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.90 to 2.10
Gas coal, 1/2-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	0.90 to 1.15
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

### Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.

No. 3 distillate	4.25c.
No. 4 industrial	3.87 1/2c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	4.25c.
No. 4 industrial	3.87 1/2c.

Per Gal. del'd Chicago

No. 3 industrial fuel oil	5.00c.
No. 5 industrial fuel oil	3.77c.

Per Gal. f.o.b. Cleveland

No. 3 distillate	5.50c.
No. 4 industrial	5.25c.
No. 5 industrial	4.50c.

## REFRACTORIES

### Fire Clay Brick

Per 1000 f.o.b. Works

High-heat Intermediate Duty Brick	Duty Brick
Pennsylvania	\$4

# Warehouse Prices for Steel Products

## PITTSBURGH

	Base per Lb.
Plates	3.15c
Structural shapes	3.15c
Soft steel bars and small shapes	2.95c
Reinforcing steel bars	2.90c
Cold-finished and screw stock:	
Rounds and hexagons	3.35c
Squares and flats	3.35c
Hoops and bands under 1/4 in.	3.20c
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c
Galv. sheets (No. 24), 25 or more bundles	3.35c
Hot-rolled sheets (No. 10)	2.95c
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.69
Spikes, large	2.90c
Track bolts, all sizes, per 100 count, 65 per cent off list	
Machine bolts, 100 count	65 per cent off list
Carriage bolts, 100 count	65 per cent off list
Nuts, all styles, 100 count	65 per cent off list
Large rivets, base per 100 lb.	\$3.50
Wire, black, soft ann'l'd, base per 100 lb.	\$2.70
Wire, galv. soft, base per 100 lb.	\$2.925
Common wire nails, per keg	\$2.834
Cement coated nails, per keg	\$2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.  
\*Delivered in Pittsburgh switching district.

## CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c
Soft steel bars, rounds	3.00c
Soft steel bars, squares and hexagons	3.15c
Cold-fn. steel bars:	
Rounds and hexagons	3.50c
Flats and squares	3.50c
Hot-rolled strip	3.30c
Hot-rolled annealed sheets (No. 24)	3.85c
Galv. sheets (No. 24)	4.55c
Hot-rolled sheets (No. 10)	3.05c
Spikes (keg lots)	3.50c
Track bolts (keg lots)	4.65c
Rivets, structural (keg lots)	3.65c
Rivets, boiler (keg lots)	3.75c
Machine bolts	Per Cent Off List
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap or	
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hex. tap or	
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	*37 1/2
Cut point set screws	*75 and 10
Flat head bright wood screws	70
Spring cotter	55
Store bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57 1/2
Wrought washers	\$4.50 off list
Black ann'l'd wire per 100 lb.	\$3.85
Com. wire nails, base per keg	2.95†
Cement c't'd nails, base per keg	2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.  
\*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.  
†Prices for city and suburbs only.

## NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.40c
Structural shapes	3.37c
Soft steel bars, rounds	3.31c
Iron bars	3.31c
Iron bars, swed. charcoal	6.75c to 7.00c
Cold-fn. shafting and screw stock:	
Rounds and hexagons	3.81c
Flats and squares	3.81c
Cold-rolled: strip, soft and quarter hard	3.36c
Hoops	3.56c
Bands	3.56c
Hot-rolled sheets (No. 10)	3.31c
Hot-rolled ann'l'd sheets (No. 24*)	3.89c
Galvanized sheets (No. 24*)	special
Long term sheets (No. 24)	5.25c
Standard tool steel	11.00c
Wire, black annealed (No. 10)	3.40c
Wire, galv. (No. 10)	3.75c
Tire steel, 1 x 1/4 in. and larger	3.75c
Open hearth spring steel	4.00c to 10.00c
Common wire nails, base, per keg	\$3.21
Machine bolts, square head and nut:	Per Cent Off List
All diameters	.65 and 10
Carriage bolts, cut thread:	
All diameters	.65 and 10

	Per 100 Ft.
Boiler tubes:	
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

## ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.45c
Bars, soft steel (rounds and flats)	3.25c
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.40c
Cold-fn. rounds, shafting, screw stock	3.75c
Hot-rolled annealed sheets (No. 24)	4.10c
Galv. sheets (No. 24)	4.65c
Hot-rolled sheets (No. 10)	3.30c
Black corrug. sheets (No. 24)	4.10c
*Galv. corrug. sheets	4.65c
Structural rivets	4.00c
Boiler rivets	4.10c
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
All quantities	70

\*No. 26 and lighter take special prices.

## PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	2.98c
*Structural shapes	2.98c
*Soft steel bars, small shapes, iron bars (except bands)	3.03c
*Reinforce. steel bars, sq. twisted	2.96c
Cold-finished steel bars	3.76c
*Steel hoops	3.43c
*Steel bands, No. 12 and 3/16 in. incl.	3.18c
Spring steel	5.00c
*Hot-rolled anneal. sheets (No. 24)	3.65c
*Galvanized sheets (No. 24)	4.40c
*Hot-rolled annealed sheets (No. 10)	3.08c
Diam. pat. floor plates, 1/4 in.	4.95c
Swedish iron bars	6.25c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.  
\*Base prices subject to deduction on orders aggregating 4000 lb. or over.  
†For 50 bundles or over.  
‡For less than 2000 lb.

## CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c
Soft steel bars	3.00c
Reinforce. steel bars	2.10c
*Cold-finished steel bars	3.50c
Flat-rolled steel under 1/4 in.	3.36c
Cold-finished strip	3.00c
Hot-rolled annealed sheets (No. 24)	3.91c
Galvanized sheets (No. 24)	4.61c
Hot-rolled sheets (No. 10)	3.11c
Hot-rolled 3/16 in. to 4 1/8 in. wide sheets	3.56c
*Black ann'l'd wire, per 100 lb.	\$2.75
*No. 9 galv. wire, per 100 lb.	3.10
*Com. wire nails, base per keg	2.70

†Outside delivery 10c. less.  
\*For 5000 lb. or less.

## CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.42c
Bars, rounds, flats and angles	3.22c
Other shapes	3.37c
Rail steel reinforce. bars	3.25c
Hoops and bands, 3/16 in. and lighter	3.47c
Cold-finished bars	3.72c
Hot-rolled annealed sheets (No. 24)	4.02c
Galv. sheets (No. 24)	4.72c
Hot-rolled sheets (No. 10)	3.22c
Structural rivets	4.35c
Small rivets	.55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg	3.04
Any quantity less than carload	3.30
Cement c't'd nails, base 100-lb. keg	3.35
Chain, lin. per 100 lb.	8.50
Seamless steel boiler tubes, 2-in.	\$20.37
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.38
4-in.	45.92

## BUFFALO

	Base per Lb.
Plates	3.38c
Struc. shapes	3.25c
Soft steel bars	3.05c
Reinforcing bars	2.60c

Cold-fn. flats and sq.	3.55c
Rounds and hex.	3.55c
Cold-rolled strip steel	3.19c
Hot-rolled annealed sheets (No. 24)	4.06c
Heavy hot-rolled sheets (3/16 in., 21 to 48 in. wide)	3.63c
Galv. sheets (No. 24)	4.70c
Bands	3.43c
Hoops	3.43c
Heavy hot-rolled sheets	3.18c
Com. wire nails, base per keg	\$3.35
Black wire, base per 100 lb. (2500-lb. lots or under)	3.55
(Over 2500 lb.)	3.45

## BOSTON

	Base per Lb.
Beams, channels, angles, tees, zees	3.54c
H beams and shapes	3.54c
Plates—Sheered, tank and univ. mill.	3.56c
1/4 in. thick and heavier	3.56c
Floor plates, diamond pattern	3.36c
Bar and bar shapes (mild steel)	3.45c
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c to 4.65c
Half rounds, half ovals, ovals and bevels	4.70c
Tire steel	4.70c
Cold-rolled strip steel	3.24c
Cold-finished rounds, squares and hexagons	3.90c
Cold-finished flats	3.90c
Blue annealed sheets, No. 10 ga.	3.65c
One pass cold-rolled sheets No. 24 ga.	4.20c
Galvanized steel sheets, No. 24 ga.	4.90c
Lead coated sheets, No. 24 ga.	5.85c

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

## DETROIT

	Base per Lb.
Soft steel bars	3.09c
Structural shapes	3.42c
Plates	3.42c
Floor plates	5.17c
Hot-rolled annealed sheets (No. 24)	3.94c
Hot-rolled sheets (No. 10)	3.14c
Galvanized sheets (No. 24)**	4.72c
Bands	3.39c
Hoops	3.39c
*Cold-finished bars	3.16c
Cold-rolled strip	3.18c
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.23c*
Bolts and nuts, in cases	70 and 10 per cent off list

Broken cases .70 per cent off list  
Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.  
\*Price applies to 1,000 lb. and over.  
†With reduction in chemical extras.  
\*\*0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only.

## MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c
Soft steel bars, rounds up to 8 in. flats and fillet angles	3.11c
Soft steel bars, squares and hexagons	3.29c
Hot-rolled strip	3.41c
Hot-rolled sheets (No. 10)	3.16c
Hot-rolled and anneal. sheets (No. 24)	3.96c
Galvanized sheets (No. 20)	4.66c
Cold-finished steel bars	3.61c
Cold-rolled strip	3.33c
Structural rivets (keg lots)	3.86c
Boiler rivets, cone head (keg lots)	3.96c
Track spikes (keg lots)	3.71c
Track bolts (keg lots)	4.86c
Black annealed wire	3.15c
Com. wire nails	2.85c
Cement coated nails	2.85c
Machine bolts	Per Cent Off List
Carriage bolts	70 and 10
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	70 and 10

Prices given above are delivered Milwaukee.  
On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

## ST. PAUL

	Base per Lb.
Mild steel bars, rounds	3.25c
Structural shapes	3.45c
Plates	3.45c
Cold-finished bars	4.02c
Bands and hoops	3.55c
Hot-rolled annealed sheets, No. 24	3.90c
Galvanized sheets, No. 24	4.50c
Cold-rolled sheets, No. 20	4.95c

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

## BALTIMORE

	Base per Lb.
*Mild steel bars	3.00c

**Reinforcing bars	2.85c
*Structural shapes	3.00c
†Plates	3.00c
‡Hot-rolled sheets, No. 10	3.10c
§Hot-rolled annealed sheets, No. 24	3.60c
¶Galvanized sheets, No. 24	4.30c
*Bands	3.20c
*Hoops	3.45c
*Cold-rolled rounds	3.58c
*Cold-rolled squares, hex. and flats	3.58c
Rivets	4.40c
Bolts and nuts, per cent off list	.60 and 10

\*Quantity extras per size apply. †Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base: 1500 lb. to 1999 lb. add 15c. per 100 lb.; 1000 lb. to 1499 lb. add 30c.; 0 to 999 lb. add 50c.  
‡25 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 24 bundles add 25c.  
§Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 300 to 499 lb. add \$1.00; for 0 to 299 lb. add \$1.75; for combined order under 100 lb. add \$3.00.

¶For orders 4000 lb. to 9999 lb. Add 15c. per 100 lb. for orders 2000 to 3999 lb.; add 65c. for orders less than 2000 lb.

## CHATTANOOGA

	Base per Lb.
Mild steel bars	3.36c
Iron bars	3.36c
Reinforcing bars	3.36c
Structural shapes	3.56c
Plates	3.56c
Hot-rolled sheets, No. 10	3.36c
Hot-rolled annealed sheets, No. 24	4.16c
Galvanized sheets, No. 24	4.86c
Steel bands	3.61c
Cold-finished bars	3.98c

## MEMPHIS

	Base per Lb.
Mild steel bars	3.47c
Shapes, bar size	3.47c
Iron bars	3.47c
Structural shapes	3.67c
Plates	3.67c
Hot-rolled sheets, No. 10	3.47c
Hot-rolled annealed sheets, No. 24	4.27c
Galvanized sheets, No. 24	4.98c
Steel bands	3.72c
Cold-drawn rounds	3.89c
Cold-drawn flats, squares, hexagons	5.89c
Structural rivets	4.25c
Bolts and nuts, per cent off list	.65
Small rivets, per cent off list	.50

## NEW ORLEANS

	Base per Lb.
Mild steel bars	3.35c
Reinforcing bars	3.50c
Structural shapes	3.55c
Plates	3.55c
Hot-rolled sheets, No. 10	3.55c
Hot-rolled annealed sheets, No. 24	4.50c
Galvanized sheets, No. 24	4.95c
Steel bands	3.95c
Cold-finished steel bars	4.30c
Structural rivets	4.25c
Boiler rivets	4.25c
Common wire nails, base per keg	\$2.95
Bolts and nuts, per cent off list	.70

## PACIFIC COAST

	Base per Lb.
	San Fran. Los Angeles Seattle
Plates, tank and U. M.	3.25c 3.60c 3.55c
Shapes, standard	3.25c 3.60c 3.55c
Soft steel bars	3.25c 3.60c 3.70c
Reinforcing bars, f.o.b. cars dock	
Pacific ports	2.45c 2.45c 2.45c
Hot-rolled annealed sheets (No. 24)	4.00c 4.35c 4.40c
Hot-rolled sheets (No. 10)	3.35c 3.70c 3.75c
Galv. sheets (No. 24)	4.50c 4.95c 5.00c
Cold finished steel rounds	5.80c 5.85c 6.00c
Squares and hexagons	7.05c 7.10c 7.25c
Flats	7.55c 7.60c 8.25c
Common wire nails—base per keg less carload	\$3.20 \$3.20 \$3.20

All items subject to differentials for quantity.

## TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	37c
High carbon chrome	37c
Oil hardening	22c
Extra	17c
Regular	14c



# Refrigerator Makers Large Buyers in Cleveland Area



Automotive Orders Again Light as  
Ingot Production Drops Two Points  
—Forge Shops More Active

CLEVELAND, Feb. 4. — Demand for finished steel has improved in spots but the aggregate volume of business shows little if any gain. Ingot output in the Cleveland-Lorain district dropped two points to 64 per cent of capacity this week, one local steel works having added two open-hearth and another having taken off three.

Sheet and strip mill operations thus far have been fairly well maintained but backlogs are being rapidly exhausted owing to lack of business from the automotive industry, and specifications for rolling next week are badly needed.

The extremely cold weather has been blamed for lessened activity in many directions. New demand for steel in any form from the automobile plants is very light although some sheet tonnage that had been rolled to await release is now being taken. Fisher Body Corp'n. this week reduced the operation of its Cleveland plant from five to four days and made a slight cut in its working force, but it expects that the reduced schedule will remain in effect only for a very short period. Some forge shops and stamping plants doing automotive work from which business has been very scarce recently are ordering bars and sheets in somewhat better volume, and there has been a new spurt in the demand for hot strip from non-integrated cold-rolled strip plants. Some of the refrigerator manufacturers that have been buying sheets in very limited quantities placed sizable lots during the week. Miscellaneous demand for sheets from makers of stoves and other household equipment continues fairly good.

Wheeling & Lake Erie railroad is inquiring for 1300 tons of sheet piling for dock construction at Huron, Ohio. The order may be divided between two or three mills. The inquiry from the Erie railroad for 800 cars is not yet out.

Steel making scrap has advanced slightly on small sales and the market is very firm.

## Pig Iron

Sales are confined to small lots and the volume of business shows virtually no change. This indicates that not many consumers are getting their low priced stocks used up. January sales were virtually the same as in December and shipments were 60 per cent as large as those during the previous month. Foundry coke shipments in January gained 10 per cent over December, which is evidence of an increase in the melt. While demand for iron from foundries making railroad equipment and from makers of heating equipment has improved, shipments to foundries making automobile castings have declined.

## Sheets

Refrigerator manufacturers placed orders during the week for substantial tonnages, indicating

that this industry is preparing to get under good production schedules on 1936 models. Some of the sheets purchased are expected to cover requirements well into April. The slight spurt in the demand from the motor car industry, reported last week, was short lived. Business from that source has again declined, although some full finished sheets are now being shipped that had been made the last few weeks and held in stock subject to release. Mill operations have been curtailed and backlogs are being wiped out. Miscellaneous demand is fair. The local continuous mill is operating at 50 per cent of capacity this week.

## Strip Steel

New business in hot-rolled strip in sizeable lots has come from non-integrated cold rolling plants, apparently in anticipation of better business a little later. However, very little business is coming from motor car manufacturers and parts makers and some of the mills have little tonnage in cold rolled strip left on their books.

## Tin Plate

Canners are now contracting for their season's requirements and predict a heavy fruit and vegetable pack during 1936 providing the season's crops are normal. Some makers have increased production, having a good volume of general line orders that were carried over from December. Beer cans are

## TRIPLE COMPRESSION SCRAP BALERS



STYLE  
**100 TC**  
(100 x 51 x 36)  
and other sizes

Also Regular  
**Double  
Ram Presses**  
in all sizes



**GALLAND-HENNING**  
MANUFACTURING COMPANY

2724 S. 31st Street Milwaukee, Wisconsin

COMPLETE LINE OF BALERS: Electric and Hydraulic, also HYDRAULIC PRESSES AND PUMPS



# ARMSTRONG



## Chrome-Vanadium SOCKETS

Here is a complete line of accurately made, finely finished sockets all standard sizes and types from tiny 5/32" miniatures to great 5" Bridge Wrench Sockets (not illustrated).

Unique to the ARMSTRONG Socket Wrench Sets is the patented Drivelock that locks socket to driver, driver to ratchet, and extension to extension—makes of each assembly a rigid tool that meets industrial requirements of strength and safety.



9 Types. All Sizes. Double Hex. and Double Square.

Miniatures 3/4" Drive; Light 3/4" Drive, Standard 1/2" Drive; Extra Deep 3/4" Drive; Straight Wall 1/2" Sq. Drive; Heavy Duty 3/4" Sq. Drive; Deep Heavy Duty 3/4" Sq. Drive; Extra Heavy Duty 1" Hex. Drive.

Write for Catalog W-35  
**ARMSTRONG BROS. TOOL CO.**  
"The Tool Holder People"  
309 N. Francisco Ave., CHICAGO, U.S.A.  
New York San Francisco London

expected to take an increasing amount of tin plate this year.

### Bolts and Nuts

Shipments have dropped sharply because of hold-ups due to the curtailment of automobile production and the cold weather is blamed for some falling off in the demand from jobbers and from some other sources. The decreased demand is regarded as only temporary. Prices appear to be fairly firm.

### Bars, Plates and Shapes

A moderate revival of demand for steel bars from some of the forge shops making automobile parts developed during the week. Business from this source had been very slack recently. Curtailed automobile production has affected the demand for bars from other manufacturers of automotive parts. Demand from miscellaneous consumers is fair. Inquiry in the construction field continues light. Erie railroad grade crossing elimination work in Jamestown, N. Y., will take 600 tons of shapes for which bids will be taken shortly by the New York Highway Department. The Ohio State Highway Department opens bids today for a Lorain County bridge requiring 1200 tons. Reinforcing bars are in good demand for PWA work. Several hundred tons are now pending in inquiries from the State Highway Department for numerous lots of less than 50 tons each. Sharp price

concessions on reinforcing bars are commonly quoted.

### Scrap

A Youngstown district mill has purchased a small tonnage of heavy melting steel at \$15 for No. 1 and \$14.25 for No. 2, which represent an advance over recent prices. The market is very firm. The supply, not plentiful for some time, has been further curtailed by the cold weather during the past week. Brokers are paying \$13.50 or higher for No. 1 heavy melting steel for Cleveland delivery. Blast furnace grades are firmer, bringing as high as \$9 from brokers. Under existing conditions brokers are showing no disposition to sell scrap except in small lots, although a spell of warmer weather doubtless will bring out a more plentiful supply.

American Airlines has doubled its order for new Douglas D S P transport planes bringing the total order to 20 planes, 10 of which will be built with sleeper accommodations and 10 for day flight.

The Boston office of the Bethlehem Shipbuilding Corp., Ltd., repair division, has been moved from 75 Federal Street to the corporation's Atlantic works, 80 Border Street, East Boston.

## Scrap Prices Higher In St. Louis Area

ST. LOUIS, Feb. 4.—Although the mills in the St. Louis district have not bought any scrap in several weeks and probably will not buy for several weeks more, dealers' prices continue to advance. There is said to be a considerable short interest, and dealers are offering more money for scrap in order to fill their orders.

While the higher prices offered are enabling the dealers to buy material, the sub-zero weather which has prevailed here for the last two weeks has retarded shipments greatly. Heavy melting steel, No. 2 railroad wrought, cast iron borings, shoveling turnings and railroad malleable are all 50c a ton higher, and miscellaneous standard section rails are up 25c.

Shipments and sales of pig iron continue light, as the result of a heavy movement to melters during the last quarter of 1935. Operations in the agricultural implement belt at Peoria and Moline, Ill., continue at the same high rate which has prevailed for months. Operations in the Belleville, Ill., stove district have been retarded by a strike, only one of seven plants having signed up with the union.

Trade in finished iron and steel continues on the same basis of the last few weeks, buying being for immediate needs. The St. Louis Southwestern is expected to place orders this week for from 1000 to 1500 tons of rails.

## Cast Iron Pipe

State of Massachusetts has awarded 260 tons of 8-in. for Haverhill and Hopkinton works to Warren Foundry & Pipe Corp.

Pear Ridge, Tex., will soon take bids for pipe for water system and other waterworks installation, including elevated steel tank and tower. Cost about \$30,000.

Alvo, Neb., closes bids Feb. 17 for about 8648 ft. of various sizes for water system; 20,000-gal. elevated steel tank on 100-ft. tower, with alternate bids on 25,000-gal. similar tank; deep well turbine pumping machinery and auxiliary equipment. Henningson Engineering Co., Union State Bank Building, Omaha, Neb., is consulting engineer.

Winchester, Va., plans pipe lines for water system, including main trunk and distribution lines, totaling about 11 miles. Cost close to \$350,000. Whitman, Requardt & Smith, West Biddle and Charles Streets, Baltimore, are consulting engineers.

East Smithfield, R. I., plans pipe lines for water system in Esmond Village district; also other waterworks installation. Cost about \$180,000. Jenks & Ballou, Industrial Trust Building, Providence, R. I. are consulting engineers.

Colerain, N. C., plans pipe lines for water system. Fund of \$28,000 has been arranged for this and sewer installation.

P. M. Van Camp, Southern Pines, N. C., is consulting engineer.

**Special Improvement District No. 25** Billings, Mont., care of C. E. Durland Billings, engineer, plans 4 to 8-in. for water system in recently created district; also new pumping plant and other waterworks installation. Fund of \$57,000 is being arranged through Federal aid.

**Maxwell Utility District**, Maxwell, Cal. C. N. Lausten, secretary, plans pipe lines for water system; also other waterworks installation. Fund of \$63,000 is being arranged through bond issue and Federal aid for this and sewer installation.

**Buffalo, Tex.**, closes bids Feb. 11 for about 15,000 ft. of 2 to 8-in. for water system; also for elevated steel tank and tower, pumping machinery and auxiliaries Southwest Engineering Co., Littlefield Building, Austin, Tex., is consulting engineer.

**Hatton, N. D.**, plans pipe lines for water system; also other waterworks installation Elmer Osking, mayor, is in charge of project.

**Murdock, Neb.**, plans pipe lines for water system. Fund of \$17,000 is being arranged through bond issue and Federal aid for this and other waterworks installation.

**Los Lunas, N. M.**, plans pipe lines for water system; also other waterworks installation. Fund of \$38,000 is being arranged. New Mexico Engineering Co. Albuquerque, N. M., is consulting engineer

## Pipe Lines

**Shell Pipe Line Corp.**, Shell Building, St. Louis, a subsidiary of Shell Petroleum Corp., same address, plans new 10-in. welded steel pipe line from Hobbs, N. M., oil field district to connection with main trunk line in Henrick oil fields, west Texas, about 41 miles, for crude oil transmission. Connection will be made with present steel pipe line gathering system at first-noted place.

**Lansing, Mich.**, has called special election Feb. 25 to approve bond issue of \$4,400,000 for a municipal gas utility, including new welded steel pipe line from Montcalm-Mecosta Counties natural gas field to city limits, installation of steel pipe line distribution system and natural gas distribution plant.

**Magnolia Petroleum Co.**, Magnolia Building, Dallas, Tex., plans new 8-in. welded steel pipe line in oil field district near Oklahoma City, Okla., to connection with main trunk system, about five miles, for crude oil transmission. Cost close to \$80,000.

**Godfrey L. Cabot, Inc.**, Charleston, W. Va., plans two 6-in. welded steel pipe lines across Kanawha River, near Charleston, for natural gas transmission. Headquarters of company are at 77 Franklin Street, Boston.

**American Liberty Pipe Line Co.**, First National Bank Building, Dallas, Tex., has let contract to National Supply Co., Pittsburgh, for about 115 miles of 8-in. steel pipe for new crude oil transmission line from Rusk, east Texas, oil field district, to Conroe, Tex., recently referred to in these columns. Entire project will cost close to \$1,200,000.

**S. B. Avis**, Charleston, W. Va., representing pipe line interests, plans new 4-in. welded steel pipe line under Elk River for natural gas transmission.

**United States Engineer Office**, Tucumcari, N. M., has let contract to Wheeling Steel Corp. for 160,000 ft. of 6½-in. lap-welded steel pipe for irrigation installation in New Mexico.

**Prairie Gas & Utilities Syndicate, Ltd.**, Regina, Sask., G. C. Rooke, president, plans new welded steel pipe line from natural gas fields in northern Montana for natural gas supply for number of cities and communities in southern Saskatchewan area, including main trunk and distribution lines and systems, about 175 miles. Cost over \$1,500,000. Herbert R. Davis Liberty Bank Building, Buffalo, is consulting engineer.

## Air is Not Free

"Free as the air you breathe" has up to now been deemed the top in liberality. But modern science is changing even that—there's air conditioning! The air that floats your car costs the gas station man real money. And as for that compressed, restless, invisible power that strains the air lines in your plant—that is expensive, as any man who pays power bills can tell you.



Air Crowds In

Industry packs air into cylinders, uses it to clamp work in place, to feed work in machining operations, to exert predetermined pressure where pressure is needed. To hold this charging, relentless power in leash, to release it at the proper split second, a trigger is placed on the cylinder.

That's an operating valve—it controls the air cylinder. Many types of valves will keep the bursting air under control for awhile. If it's a poor valve—Old Man Friction gnaws at its parts, develops rifts and the valve leaks. If the valve bears the Ross nameplate, it's made to overcome these faults. The valve named Ross is a poppet valve—the air pressure seats the poppets assuring exceptional speed with air tight service over long periods of use. The hiss of an air valve supposedly closed is an expensive noise and hundreds of builders and users of machines having air controlled operations insist that all air cylinders be triggered with Ross Operating Valves, so that expensive power won't seep away.

### Men Flip Triggers

Gaping crowds, gathered on the elevated passage-way, leaned over the polished rails. Below, men in white moved briskly about among machines

that rolled and kneaded and pressed various compounds and raw rubber together, machines that incorporated rubber compound in miles of cotton fabric at temperatures held constant to a fraction of a degree, great steel drums on which were built up, ply by ply, the rubber dough-nuts that are the Seven League Boots of modern transportation.

It was at the Century of Progress and John Citizen was seeing automobile tires made!

Throughout the tire industry, air under compression serves man, the master. Men flip levers and machines respond with purposeful movement. Air rushes into air-tight chambers, is held captive momentarily, is released in an instant. There's scarcely an important operation in tire manufacture in which air cannot be utilized. The tire industry uses thousands of Ross Operating Valves, probably because they insure accurate control,



"—poppets seat"

speed production, require little maintenance. So too do the users of pipe threading machines, welders, riveting machines, baling presses, scores of other equipments, in a dozen leading industries, express marked preference for the

### ROSS OPERATING VALVE

"The Bridle for Air Horsepower"

manufactured by the Ross Operating Valve Co. at 6488 Epworth Boulevard, in Detroit, Michigan.

## Steel Lettings Light On Pacific Coast

SAN FRANCISCO, Feb. 4.—Consolidated Steel Corp. has booked 3055 tons of plates for the El Capitan-Lakeside pipeline near San Diego. At San Francisco, the United States Treasury Department bought 1260 tons of piling from Bethlehem Steel Co. for the San Diego Civic Center foundations.

Truscon Steel Co. has taken 406 tons of bars for three school projects. United States Pipe & Foundry Co. has taken 875 tons of cast iron pipe for Antioch, Cal.

Reinforcing bar inquiries aggregating 3000 tons are specified in newly listed projects. Bids will be taken Feb. 11 at Sacramento, Cal., on a motor vehicle building involving 500 tons of bars. Five industrial contracts will require 680 tons of bars and 400 tons of shapes.



# Steel Sales Decline, with Prices Weak at Philadelphia



Continued Inclement Weather  
Drives Scrap Prices Up—Mill Oper-  
ations Likely to Fall Under 40 Per  
Cent

**P**HILADELPHIA, Feb. 4.—Ad-  
verse weather conditions are  
beginning to influence steel  
sales in this area. Average book-  
ings in mid-January were about  
on a par with the comparatively  
satisfactory December average,  
but since that time there has been  
a slight but steady decline in the  
volume of orders received by mill  
offices in this area. The decline in  
retail automobile sales has been  
countrywide, and this let-down is  
reflected in a reduction in opera-  
tions of autobody stamping plants  
here. Inasmuch as these plants  
are the largest consumers of flat-  
rolled products, the recession seri-  
ously affects the district sales  
volume.

Likewise, the near-zero weather  
which has continued for several  
weeks here has paralyzed building  
and road construction. The direct  
result has been a rapid recession  
in mill deliveries of structural  
shapes, reinforcing bars and

plates. The one equalizing factor  
noticeable here is the heavier de-  
mand from shipbuilders. After  
four or five years of comparative  
inactivity, all local shipyards have  
considerable construction on their  
ways and the outlook is for fur-  
ther improved activity over the re-  
mainder of the year.

As stated last week, prices on  
many steel products are none too  
steady in the eastern Pennsyl-  
vania area and in the section south  
of Washington. Sellers make no  
secret of the fact that wire nails  
and allied wire products are being  
booked below published price lev-  
els, reinforcing steel has been bid  
in for job after job at price levels  
indicating a waiving of certain ex-  
tras, fabricating prices for struc-  
tural shapes are consistently weak,  
and in various instances larger  
consumers of light plates and full-  
finished sheets are securing their  
requirements below the publicly  
quoted price levels. The favorite

excuse for these failures of prices  
to hold is that non-integrated mills  
are undercutting in retaliation for  
the impending advances on semi-  
finished steel without a concom-  
itant rise in finished grades.  
However, this is far from true, in-  
asmuch as larger fully-integrated  
mills have had much to do with the  
action.

All mills in this area are melt-  
ing steel at a rate approximately  
equal to that of last week. The  
district average is thus retained  
at 40 per cent of capacity. But  
more than one mill here is stock-  
ing ingots at a fairly rapid pace,  
and indications are that if orders  
do not soon improve there will be  
at least a temporary falling off in  
operating activity. For the fifth  
consecutive week, the Pencoyd mill  
is operating both structural mills  
and four open-hearth furnaces.  
This is the best operating schedule  
since 1932. But the backlog at  
this plant has declined and several  
open-hearths may be taken off dur-  
ing the next fortnight.

## Pig Iron

There has been little change in  
this market. Whereas all con-  
sumers are melting at a fair rate,  
they are at the same time well  
supplied against probable con-  
sumption over the next month.  
Consequently most furnace repre-  
sentatives do not look for a return  
of interest until late February or  
early March. Prices for pig iron  
are apparently holding steady at  
the \$1-a-ton advance despite the  
weakness which has developed in  
finished steel. But there has not  
been enough new business coming  
into the market to fully test the  
attitude of sellers.

## Sheets and Strip

The decline in auto sales has  
reduced the amount of steel going  
to autobody stamping plants.  
This outlet, however, is expected  
to return to a peak level within  
the next six weeks. Shipyards are  
taking heavier tonnages and mod-  
erately large orders are being de-  
livered to Altoona, Pa., for the  
Pennsylvania car-building pro-  
gram. Miscellaneous turnover is  
not as heavy as it has been, and  
jobbers are buying in small lots  
for quick delivery. The Federal  
Prison Industries at Lewisburg,  
Pa., are taking bids today on vari-  
ous sizes and gages of sheet steel  
aggregating 100 tons. Also, the  
Marine Corps at Philadelphia is  
taking tenders tomorrow on 125  
tons of miscellaneous sheets. With  
four new Burlington Zephyrs to  
build, the Edward G. Budd Mfg.  
Co. has constructed a temporary  
building adjacent to its plant to  
take care of these orders. About

**PERFORATED METALS..**  
FOR EVERY PURPOSE

Plain and Ornamental Perforations in a great variety of sizes and styles, made in any metal.  
*Excellence of product and low prices.*

**The Harrington & King**  
PERFORATING CO.

**57 FILLMORE ST., CHICAGO - 114 LIBERTY ST., NEW YORK**



350 tons of stainless steel has been purchased for these trains.

### Bars, Plates and Shapes

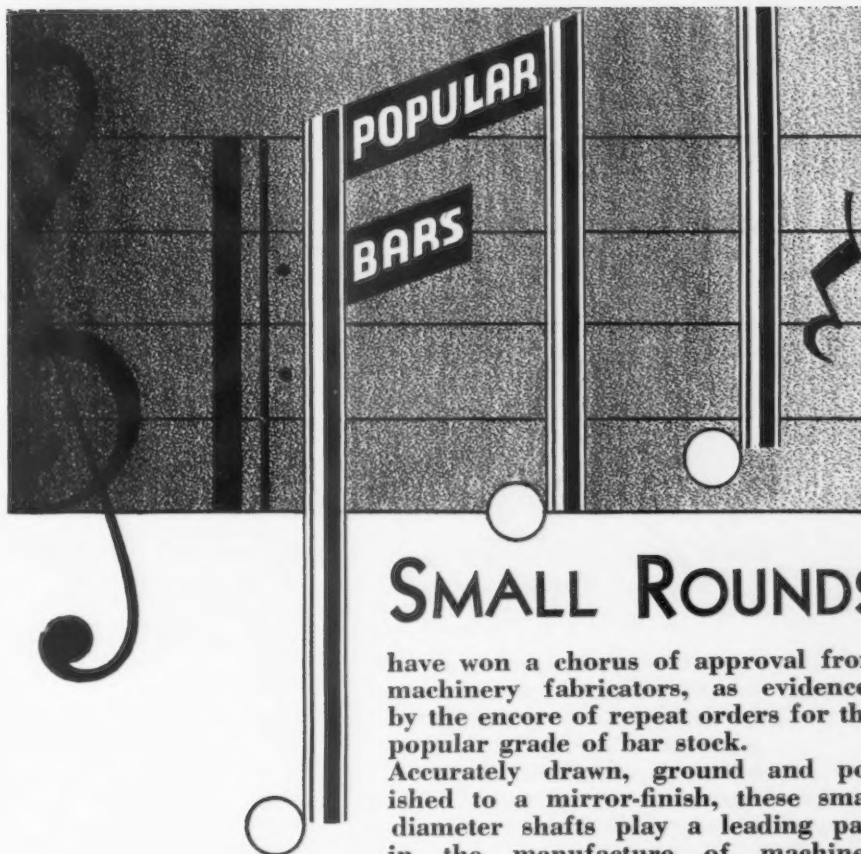
The Bethlehem Shipbuilding Corp. will open its Sparrows Point plant to build two tankers for Gulf Refining Co. About 10,000 tons of bars, plates and shapes will be used for these boats. The Sun Shipbuilding Co. has received an order from Sun Oil Co. for one tanker and is low bidder on two cargo passenger boats for the American-South African Steamship Lines. About 15,000 tons of steel will go into these three boats. General construction and highway building is about at a standstill due to severe weather. Consequently the awards of shapes and bars are in very light volume. Last week Bethlehem Steel Co. received two jobs requiring 400 tons of shapes, and the Phoenix Bridge Co. was awarded 1500 tons for the Jersey approach to the Midtown Hudson Tunnel. No large reinforcing awards have been announced. About 15,000 tons of structural business remains active, but awards on some of these projects may be delayed for several months.

### Imports

The following iron and steel imports were received here last week: 1800 tons of manganese ore from Soviet Russia; 1799 tons of pig iron from British India; 79 tons of pig iron from Sweden; 40 tons of steel bands, 82 tons of steel bars and 9 tons of structural shapes from Belgium.

### Scrap

All important grades continue strong and tending upward, mostly as the result of curtailed shipments because of inclement weather rather than a reflection of heavy mill demand. Three brokers are gathering No. 1 for delivery on the recent \$12.50 sale at Worth Steel Co. Likewise, one broker is paying \$12.50 freely and in several instances \$12.75 for desirable lots for delivery on a recent \$13 order. If the current severe weather continues, there is every indication that No. 1 steel will go beyond \$13, but it is equally likely that this price may be cut when the weather opens up sufficiently for all the small dealers to make their usual collections and deliveries. Heavy cast grades are still strong, and even though the market is quoted at \$12.50, no broker is any too anxious to sell at this figure for nearby delivery. Cast



## SMALL ROUNDS

have won a chorus of approval from machinery fabricators, as evidenced by the encore of repeat orders for this popular grade of bar stock.

Accurately drawn, ground and polished to a mirror-finish, these small diameter shafts play a leading part in the manufacture of machines, where exposed members require a smooth, bright, finished surface.

They are the keynote of quality in making precision products, as their accuracy and uniformity permit close fit in assembly and insure superior operating service. They may be substituted for more expensive steels in applications where hardening properties are not essential.

Attuned to the needs of today, B & L Small Rounds provide a faster tempo in many forms of production—try them on your next order, requiring shafts  $\frac{3}{4}$ " diameter or under.

- COLD DRAWN BARS and SHAFTING
- ULTRA-CUT STEEL
- SPECIAL SECTIONS
- ALLOY STEELS



# BLISS & LAUGHLIN, INC.

HARVEY, ILL. Sales Offices in all Principal Cities BUFFALO, N.Y.

iron car wheels have been sold in two places for \$15, and one broker is paying \$12 freely for forge fire delivered at Coatesville, Pa. Heavy axle turnings were sold last week at \$11.75 and bundled sheets are bringing around \$11.50. Standard Steel Castings' Co. secured the Budd Mfg. Co. February output of compressed sheets. The amount sold was about 3500 tons and the price was at least \$12 f.o.b. A boat is overdue at Port Richmond to complete a cargo of No. 1 for

Japan, and another boat is expected in two weeks to take on an additional 5000 tons for the same country.

Chain Belt Co., Milwaukee, and its wholly owned subsidiary, Stearns Conveyor Co., had a net profit of \$362,019 last year, compared with a profit of \$209,987 in 1934 and a loss of \$106,233 in 1933. After provisions for depreciation, maintenance, repairs and taxes, the amount earned was equivalent to \$3.02 a share of company stock.

## Pig Iron Shortage Reported in British Market—Steel Active

LONDON, Feb. 3 (*By Cable*).—Inadequate supplies continue to limit pig iron business and export sales have virtually ceased. Additional stacks are being relit in February, and an early advance in hematite prices is probable.

All departments in the steel trade are busy, but January ex-

ports are considerably lower, owing to concentration on home orders. Billet makers are unable to accept further orders. Angles and joists, ship, bridge and tank plates, and heavy rails are all well specified. Large tube orders are pending.

The tin plate market is quieter

following recent heavy purchases. South Wales holds orders approximating 4,000,000 boxes. Export inquiries include South America and the Continent for second quarter shipment.

The expected export revival in Continental iron and steel has not yet materialized. There is a heavy demand for semi-finished steel and plates and moderate business in bars, with other products dull.

Germany is securing a disproportionately large share of Far Eastern and South American markets and freight cutting is alleged. The French market is improving despite political uncertainty owing to exhaustion of consumers' stocks.

### British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export .....	\$9	
Billets, open-hearth .....	\$5 10s.	to \$5 15s.
Tin plate, per base box.....	18s. 9d.	to 19s. 3½d.
Steel bars, open-hearth .....	\$7 17½s.	
Beams, open-hearth .....	\$7 12½s.	
Channels, open-hearth .....	\$7 17½s.	
Angles, open-hearth .....	\$7 12½s.	
Black sheets, No. 24 gage.....	\$9 15s.	
Galvanized sheets, No. 24 gage....	\$11 15s.	

### Official Continental Prices, f.o.b. Continental Ports

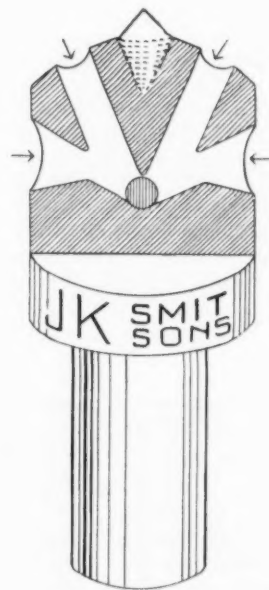
Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas.	\$2 7s.
Wire rods, No. 5 B.W.G. ....	\$4 10s.
Steel bars, merchant .....	\$3 5s.
Sheet bars.....	\$2 8s.
Plate, ¼ in. and up .....	\$4 2s. 6d.
Plate, 3/16 in. and 5 mm....	\$4 4s. 8d.
Sheets, ½ in....	\$4 9s. 8d.
Beams, Thomas.	\$3 2s. 6d.
Angles (Basic)...	\$3 2s. 6d.
Hoops and strip base .....	\$4 2s. 6d.
Wire, plain, No. 8 .....	\$5 7s. 6d.
Wire nails.....	\$5 15s.
Wire, barbed, 4 pt. No. 10 B.W.G. ....	\$8 15s.

## Water Cooled Diamond Holder

A "STA-KOOL" water cooled diamond holder is so designed that the coolant is directed not only to the point of the dia-

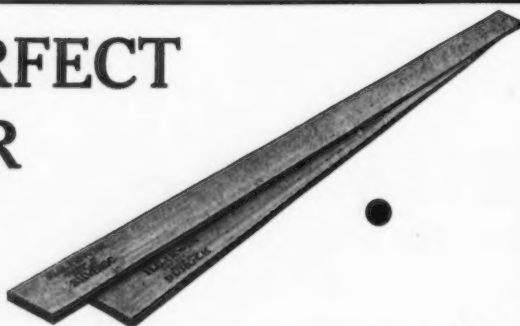


mond but also into and through the holder metal immediately in back of the diamond; the water or air channels are indicated by arrows in the illustration.

The holder is manufactured by J. K. Smit & Sons, Inc., 157 Chambers Street, New York.

The twenty-fourth annual meeting of the Chamber of Commerce of the United States will be held in Washington, April 27-30, 1936. D. A. Skinner is secretary.

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# Price Weakness Is More Pronounced at New York



Reinforcing Bars, Pipe, Nails and Sheets Are Affected — Railroads Are More Active Steel Buyers — Construction Work Dormant

NEW YORK, Feb. 4.—Maintenance of the finished steel price structure is of growing concern to sellers of steel in the Metropolitan area. While much of the current weakness in quotations is traceable to jobbers, mills are less reluctant to protect their outlets, and the tendency to quote to the trade generally the same price on sheets which had formerly been reserved for the automobile industry is spreading.

Reinforcing bar quotations are still the weakest in the list of steel products. Attractive tonnages invariably bring out prices as much as \$6 a ton under the published figures. Nails are being shaded \$3 to \$4 a ton and the automotive industry's differential of \$3 a ton on sheets is not uncommon. Buyers of butt-weld pipe 3 in. and under in diameter are being given an extra 5 per cent discount. Lap-weld material is not affected. One Eastern producer is not adhering to the 1.90c, Coatesville, price on plates, but shapes and merchant bars are relatively firm.

Tin plate quotations are also strong and contracting is heavy. Large mill warehouse stocks are not being moved and probably will not be liquidated until the time of heavy spring and early summer demand by the can companies.

Railroad buying continues to be the feature of the market. The Atlantic Coast Line has placed 6000 tons of rails with the Southern mill and the Virginian has awarded 4100 tons to the Bethlehem Steel Corp. The Lehigh Valley has been authorized to borrow the required funds from the Government to finance the rebuilding of 500 freight cars and the construction of 500 new units. The Erie is inquiring for 500 box cars and 300 automobile cars. The New York Central has not yet closed on 38,000 tons of rails and 3500 tons of accessories on which it opened bids Jan. 29.

Outside construction work is still held up by inclement weather

and mills have been able to ship little structural steel, reinforcing bars or pipe during the last two weeks. Jobbers are having the same difficulties and are feeling the burden of heavy stocks in many instances. This has inspired the offering of special discounts for cash or early payment and has not helped the general price structure.

## Pig Iron

Demand for iron remains inactive. With cold weather impairing foundry efficiency, surplus stocks on hand at a number of establishments, and limited finances, the foundries in this district are not very good buyers at present. Sales last week, made up largely of small lot orders, came to about 1720 tons, or more than 700 tons less than was booked the week before. A sizable percentage of the week's total purchases was represented by special analysis irons. The bulk of February sales, in fact, appear to have been composed mainly of specialty irons, used by the foundries in obtaining varying mixtures. The Mystic furnace at Everett, Mass., is scheduled to resume operations about April 1, and has advanced the explanation that depleted stocks and a more promising outlook for the future were instrumental in this decision. Shipments of coke to local foundries have been stimulated by cold weather, but are not heavy enough to imply that foundry melt continues to improve. A number of sellers feel that February bookings of iron will not record any appreciable gain over January.

## Reinforcing Steel

The weather continues to hold a damper over the reinforcing market this week. Movements are rather slow and prospects for the immediate future, provided the cold does not decrease to a great extent, are not particularly promising. The Branchville, Md., PWA resettlement project of 2500 tons

has been awarded to Joseph T. Ryerson & Son, Inc. P. T. Cox was awarded the 1600 tons for the Queens Approach to the Triborough bridge. Bids are expected to be opened Feb. 12 on about 3000 tons for the roadway of the Triborough bridge. Other than this the only other sizable project is the municipal warehouse on Staten Island, where a considerable tonnage will probably be involved. Prices react very weakly when confronted by large tonnages.

## Scrap

The strength of this market is predicated for the most part on a serious curtailment of deliveries due to a protracted period of near-zero weather. Many small yards are making no attempt to take care of their usual collections and deliveries, and for this reason very little material is being loaded on barges for export or on cars for eastern Pennsylvania delivery. Brokers are paying at least \$9.50 for No. 1 steel delivered alongside barges, and, in several instances, higher prices have been offered in order to attract more material to complete a boat cargo. However, brokers see no use in publicly raising prices on important grades for they believe that such action will not accelerate the flow of scrap to any extent. Fortunately the current severe weather has delayed all boats and brokers are not forced to meet shipping schedules on time. A moderate volume of new export business has been booked for April and May delivery. Prices applying on this future business are in line with current quotations, indicating that both sellers and foreign buyers anticipate a fairly active market throughout the entire first quarter.

## Detroit Scrap Prices In General Advance

DETROIT, Feb. 4.—A rise in prices has occurred on practically all products as was anticipated last week because of curtailment of auto production and the difficulty of getting men to work in yards in zero weather. The scrap market is expected to remain strong during present production slump while steel mill operations hold at a high rate.



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## Fabricated Structural Steel

Lettings in Fair Volume—New Projects Higher

**A**WARDS of 16,400 tons compare with 28,700 tons last week. Sizable bookings include 2200 tons for the Davidson County Court House at Nashville, Tenn., 1730 tons for a public school in Brooklyn, and 1700 tons for a building at Alloy, W. Va., for the Electro Metallurgical Corp'n. New projects total 11,350 tons as against 7150 tons in the previous week and 23,155 tons two weeks ago. The largest new jobs include 2000 tons for a public school in the Bronx, New York, and 1500 tons for buildings at Chicago for the Wisconsin Steel Co. Among sheet piling projects of almost 12,000 tons is 6000 to 7600 tons for dams at Gunterville and Chickamauga for the TVA. Structural steel awards for the week follow:

### NORTH ATLANTIC STATES

**Boston**, 142 tons, brewery addition, to New England Structural Co.

**Cranston, R. I.**, 175 tons, hospital buildings, to Bethlehem Fabricators, Inc.

**Cranston, R. I.**, 155 tons, dormitory buildings, to James H. Tower Iron Works.

**Buffalo**, 175 tons, addition to county office building, to Buffalo Structural Steel Co.

**Brentwood, N. Y.**, 310 tons, buildings for Pilgrim State Hospital, to Joseph T. Ryerson & Son, Inc.

**Brooklyn**, 480 tons, library for Brooklyn College, to Weatherly Steel Co.

**Brooklyn**, 1730 tons, public school No. 49, to Bethlehem Steel Co.

**Long Island City, N. Y.**, 210 tons, General Motors warehouse, to Ingalls Iron Works.

**Watervliet, N. Y.**, 750 tons, high school building, to Bethlehem Steel Co.

**Windsor, N. Y.**, 1100 tons, State highway bridge, to American Bridge Co.

**State of New Jersey**, 730 tons, highway bridges at Salem and Garfield, to Bethlehem Steel Co.

**Weehawken, N. J.**, 1400 tons, mid-town Hudson tunnel, to Phoenix Bridge Co.

**State of Pennsylvania**, 475 tons, highway bridges at Phillips, Locust and Norristown, to Bethlehem Steel Co.

**Reading, Pa.**, 370 tons, junior high school, to Reading Steel Products Co.

**Philadelphia**, 300 tons, alterations to Sixty-ninth and Market Streets terminal building, to Bethlehem Steel Co.

**Palmyra, Pa.**, 100 tons, junior and senior high school, to Bethlehem Steel Co.

### SOUTH AND SOUTHWEST

**Alloy, W. Va.**, 1700 tons, building for Electro-Metallurgical Corp'n., to Lackawanna Steel Construction Co.

**Nashville, Tenn.**, 2200 tons, Davidson County courthouse, to Bethlehem Steel Co.

**Greenville, Miss.**, 260 tons, warehouse extension to United States Gypsum Co., to Stupp Brothers Bridge & Iron Co.

**Tucson, Ariz.**, 270 tons, addition for University of Arizona, to Midwest Steel & Iron Co.

### CENTRAL STATES

**Upper Sandusky, Ohio**, 100 tons, bridge, including 40 tons of reinforcing bars; structural contract to Fort Pitt Bridge Works Co.

**Peoria, Ill.**, 300 tons, lock, to Lakeside Bridge & Steel Co.

**Manteno, Ill.**, 600 tons, State hospital, to Duffin Iron Co.

**La Salle, Ill.**, 160 tons, school, to Duffin Iron Co.

**East Moline, Ill.**, 120 tons, public building, to Duffin Iron Co.

**Chicago**, 130 tons, theater on Belmont Avenue, to Duffin Iron Co.

**Indiana Harbor, Ind.**, 1100 tons, motor and soaking pit building for Inland Steel Co., to Joseph T. Ryerson & Son, Inc.

**State of Minnesota**, 160 tons, bridge, to American Bridge Co.

**Ely, Minn.**, 145 tons, highway bridge, to American Bridge Co.

**Robbinsdale, Minn.**, 300 tons, school, to Kowin & Co.

**East St. Louis, Ill.**, 160 tons, building for American Brake Shoe & Foundry Co., to Austin Co.

**McPherson County, Kan.**, 210 tons, highway bridge, to Kansas City Structural Steel Co.

**Seward County, Kan.**, 370 tons, highway bridge, to Illinois Steel Bridge Co.

### WESTERN STATES

**Mesa County, Colo.**, 495 tons, overpass, to Midwest Steel & Iron Co.

### NEW STRUCTURAL STEEL PROJECTS

#### NORTH ATLANTIC STATES

**Waltham, Mass.**, 300 tons, County hospital units.

**Medford, Mass.**, 200 tons, city office building.

**New York**, 2000 tons, public school No. 113 in Bronx.

**State of New York**, 1200 tons, highway bridges.

**Albany, N. Y.**, 800 tons, store and office building for A. P. W. Paper Co.

**State of New York**, 810 tons, including Port Chester bridge, 500 tons; Thomkins County bridge, 110 tons; Delaware County bridge, 200 tons.

**Buffalo**, 500 tons, addition to plant of Trico Products Corp'n.; bids Feb. 7.

**Jamestown, N. Y.**, 600 tons, grade crossing elimination.

**State of New Jersey**, 500 tons, four highway projects on Route 6, Section 7; bids Feb. 17.

**State of New Jersey**, 660 tons, highway bridges in Bergen County.

**Baltimore**, 300 tons, warehouse for Young Analine Works.

**Washington**, 3500 tons, Federal Reserve Bank building; George A. Fuller Co., general contractor.

### THE SOUTH

**Love, Ky.**, 350 tons, city hospital clinic.

### CENTRAL STATES

**Detroit**, 500 tons, addition to laboratory for Argonaut Realty Corp'n.

Grand Rapids, Mich., 300 tons, cranes for Fisher Body plant.

Chicago, 1500 tons, buildings for Wisconsin Steel Co.

Omaha, Neb., 450 tons, bakery.

Topeka, Kan., 375 tons, bridge.

#### SHEET PILING

##### NEW PROJECTS

Washington, 1000 tons, foundation piling.

Galveston, Tex., 2000 tons, jetties.

Guntersville, Ala., 6000 to 7600 tons. Guntersville and Chickamauga dams; bids opened by TVA on Jan. 31.

Huron, Ohio, 1300 tons, for Wheeling & Lake Erie Railroad docks.

## Great Lakes to Add Four Open-Hearths

PILES are now being driven for the foundations of four new open-hearth furnaces at the Great Lakes Steel Corp'n. plant at Ecorse, Mich. Like the present eight furnaces, the new units will have a nominal capacity of 200 tons each daily, adding 50 per cent to the ingot capacity of this plant.

Owing to the fact that Great Lakes rolls more steel than it melts, its own ingot rate has been practically at 100 per cent capacity for over a year. During seasonal slack times in the mill, ingots were stored, and during peak production additional steel in the form of ingots or blooms was bought outside.

With the installation of an 80-in. continuous hot strip mill with 600,000 gross tons annual capacity nearing completion in another month, the need for additional melting capacity became obvious, even though the ingot rate for the industry as a whole hovers around 50 per cent. When the new furnaces are in operation, the total daily melting capacity will be 2400 tons. This figure compares with Ford Motor Co.'s capacity of 1100 tons and Rotary Electric Steel Co.'s 250 tons daily.

A total of \$10,000,000 spent on repairs and expansion has been reached with the recent announcement by the English Steel Corp'n., Ltd., to spend \$3,750,000 to further reconstruct and extend its Sheffield Works. This company reports during the past three years, a 40 per cent increase in employees, a 79 per cent increase in wages, a 28 per cent increase in individual earnings and \$45,000 a week extra in wages.



## American and German Interests Back Norwegian Stainless Steel Plant

A BERLIN, Germany, interest is indirectly interested in plans for the establishment at Larvik, on the south coast of Norway, of what may in time become the largest stainless steel producing plant in Europe. The sponsors and the capital involved are mainly American, and Krupp's have denied any connection with the promotion of the project. However, it is believed that the German government has relieved the sponsors' anxieties regarding export markets by agreeing to permit the entry into Germany of large quantities of the stainless steel ingots produced at the Larvik plant. These, it is understood, would be manufactured into finished products at the Krupp works at Essen.

German sympathy with the project arises from the opportunity offered of obtaining a semi-finished product which is of increasing importance for armaments manufacture and contains raw materials scarce in Germany. The arrangement also involves a minimum expenditure of foreign exchange inasmuch as the stainless steel ingots would be paid for partly through Krupp's re-exports of finished

goods and partly, it is believed, through the providing by Krupp of machinery and technical assistance for the Larvik plant.

The process to be used at Larvik is stated to combine the best features of American, Swedish, and Strauss-Krupp processes, and the fact that the Strauss-Krupp patents have now expired probably has some bearing on the project. A Norwegian enterprise, Elektrostahl, which is interested in the project, has recently conducted a series of successful experiments in stainless steel production.

Larvik has been selected for the plant because of its abundance of cheap hydro-electric power, proximity to European markets, water transport facilities, and the liberal concessions which the Norwegian government is prepared to make. The promoters expect to produce stainless steel more cheaply than has hitherto been possible anywhere in Europe.

The factory will start with a staff of 300 men and an annual production of 30,000 tons of stainless steel ingots, but this output will be gradually increased as market conditions in Europe improve.



# Spot Tin Still Scarce Despite Gain In World and Domestic Supplies

Brief Weakness in Zinc Prices Is Corrected Without Heavy Bookings—  
Copper Sales Improving—Lead Demand Strong

**N**EW YORK, Feb. 4.—Domestic sales of copper during January have finally been placed at 33,167 tons, indicating that demand grew better toward the close of the month. Earlier expectations were that bookings would not reach 30,000 tons. The moderate improvement in this respect continued over most of last week, with sales on Jan. 31 having reached 2250 tons. Improvement in the foreign price has occurred coincident with the weakening in the American dollar. The domestic price remains unchanged at 9.25c a lb., Connecticut Valley.

## Tin

January statistics revealed deliveries in this country of 6635

tons, against 5360 tons a month earlier. Domestic stocks increased from 2312 tons to 2985 tons, while the world's total visible supply, including the Eastern and Arhem carryover, rose from 15,318 tons to 17,233 tons. These figures were considered fairly favorable, but were generally anticipated. Of chief interest in the domestic market last week was the sudden realization by consumers that spot and nearby supplies were extremely scarce. Accordingly, considerable pressure to purchase developed, but dealers and importers could not satisfy the demand. Owing to the shortage, spot prices moved upward. A week ago today, the New York quotation on spot

Straits tin was 46.30c. a lb., which, on the following day, jumped to 48.15c. Today the quotation is largely nominal at 48.00c. Reason for this unlooked for tightness in prompt supplies is seen in the fact that January arrivals, though quite heavy, were sold out in advance.

## Lead

Last week's sales were heavier than for any six-day period for quite some time. Strong representative buying included battery, pigment, tin foil, bearing metal, and cable interests, as well as others. Producers, not being able to satisfy all customers, adopted a rather cautious attitude, and built up temporary waiting lists in certain instances. The week's total sales, which involved a number of average-price contracts, were possibly 20 per cent greater than the previous week's commitments. Yesterday and today saw no change take place as far as an active rate of demand is concerned. All sellers are holding firmly to the 4.50c. a lb. price level, with the leading producer readily obtaining a \$1 a ton premium on business secured in the East.

## Zinc

The market opened quiet this morning, but toward the middle of last week some agitation developed over a weakened price level. On Jan. 29, one first-hand seller openly sold at 4.80c. a lb., East St. Louis, following which it was established that some metal was disposed of at a price five points lower, or at 4.75c. a lb. The majority of producers, however, held to the 4.85c. level, which price has remained the official market quotation. This disturbance in the trade lasted for one day only, and it is believed that hardly more than one-fifth of the total tonnage booked during the week went at a concession. With all hands returned to the accepted price basis, zinc is firm today at 4.85c. a lb.

## Non-Ferrous Averages

The average prices for the major non-ferrous metals for January, based on daily quotations in THE IRON AGE, are as follows:

	Average
Electrolytic copper, Conn.†	9.250c. a lb.
Lake copper, Eastern delivery	9.375c. a lb.
Straits tin, spot, N. Y.	47.226c. a lb.
Zinc, East St. Louis	4.850c. a lb.
Zinc, New York	5.225c. a lb.
Lead, St. Louis	4.350c. a lb.
Lead, New York	4.500c. a lb.

†Price ¼c. lower in New York.

## The Week's Prices. Cents Per Pound for Early Delivery

	Jan. 29	Jan. 30	Jan. 31	Feb. 1	Feb. 3	Feb. 4
Electrolytic copper, Conn.*	9.25	9.25	9.25	9.25	9.25	9.25
Lake copper, N. Y.	9.37½	9.37½	9.37½	9.37½	9.37½	9.37½
Straits tin, Spot, New York	48.15	48.12½	48.37½	48.12½	48.12½	48.00
Zinc, East St. Louis	4.85	4.85	4.85	4.85	4.85	4.85
Zinc, New York†	5.22½	5.22½	5.22½	5.22½	5.22½	5.22½
Lead, St. Louis	4.35	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.50	4.50	4.50	4.50	4.50	4.50

\*Delivered Connecticut Valley; price ¼c. lower delivered in New York.

†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.00c.-22.00c. a lb., delivered.  
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 17.00c. lb., delivered.  
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.  
Antimony, Asiatic, 12.87½c. a lb., New York.  
Quicksilver, \$77.50 to \$78.00 per flask.  
Brass ingots, commercial 85-5-5-5, 9.50c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

## From New York Warehouse

Delivered Prices, Base per Lb.	
Tin, Straits pig	49.00c. to 50.00c.
Tin, bar	51.00c. to 52.00c.
Copper, Lake	10.25c. to 11.25c.
Copper, electrolytic	10.25c. to 11.25c.
Copper, castings	10.00c. to 11.00c.
*Copper sheets, hot-rolled	16.50c.
*High brass sheets	14.62½c.
*Seamless brass tubes	16.87½c.
*Seamless copper tubes	17.00c.
*Brass rods	13.12½c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	5.00c. to 6.00c.
Lead, bar	6.00c. to 7.00c.
Lead, sheets, cut	8.25c.
Antimony, Asiatic	14.00c. to 15.00c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.50c. to 20.00c.
Solder, ½ and ½	29.50c. to 30.50c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

\*These prices are also for delivery from Chicago and Cleveland warehouses.

## From Cleveland Warehouse

Delivered Prices per Lb.	
Tin, Straits pig	53.00c.
Tin, bar	55.00c.

Copper, Lake	10.25c.
Copper, electrolytic	10.25c.
Copper, castings	10.00c.
Zinc, slabs	6.25c. to 6.50c.
Lead, American pig	5.20c. to 6.50c.
Lead, bar	8.50c.
Antimony, Asiatic	17.00c.
Babbitt metal, medium grade	19.25c.
Babbitt metal, high grade	57.00c.
Solder, ½ and ½	30.00c.

## Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.12½c.	7.87½c.
Copper, hvy. and wire	7.00c.	7.50c.
Copper, light and bottoms	6.00c.	6.50c.
Brass, heavy	4.00c.	4.62½c.
Brass, light	3.25c.	4.00c.
Hvy. machine composition	6.00c.	6.50c.
No. 1 yel. brass turnings	5.12½c.	5.62½c.
No. 1 red brass or compos. turnings	5.62½c.	6.12½c.
Lead, heavy	3.50c.	3.87½c.
Zinc	2.50c.	2.87½c.
Cast aluminum	12.12½c.	13.25c.
Sheet aluminum	13.25c.	14.75c.



## Reinforcing Steel

Awards 3735 Tons—New  
Projects 2300 Tons

### AWARDS

**Boston,** 185 tons, Brooks school, to Concrete Steel Co.

**Branchville, Md.,** 2500 tons, housing project, to Joseph T. Ryerson & Son, Inc.

**Oak Park, Ill.,** 580 tons, sewer project, to an unnamed bidder.

**Cincinnati,** 500 tons, well covering for city waterworks, to Joseph T. Ryerson & Son, Inc.

### NEW REINFORCING BAR PROJECTS

**Medford, Mass.,** 100 tons, city office building.

**Elgin, Ill.,** 600 tons, sewer.

**Wiota, Mont.,** 1600 tons, Fort Peck dam project; bids Feb. 11, Kansas City Engineer Office.

## Business in 1935

### Showed Improvement

**B**USINESS activity during 1935 was greater than for any of the preceding recovery years, according to an analysis of reports of production and distribution by the National Industrial Conference Board.

Although complete figures for December are not available, it is apparent that industrial production during the last quarter of the year reached the highest level since the second quarter of 1930. Distribution, indicated by retail sales and by the volume of goods transported, advanced materially during the last quarter of 1935.

The increases in production in 1935 in the major industries, compared with 1934, were 92.4 per cent for residential building, 86.1 per cent for machine tool orders, 45 per cent for automobiles, 30.6 per cent for steel ingots, 2.6 per cent for bituminous coal, 9.2 per cent for electric power, 9.3 per cent for petroleum, and 19.5 per cent for total construction.

The volume of department store sales in 1935 was 7.1 per cent larger than in 1934. Miscellaneous carloadings were 6.6 per cent more, and total carloadings were 2.2 per cent greater than during the previous year.

The early introduction of 1936 models of passenger cars has had some effect upon maintaining automobile sales at unusual high levels during the last quarter of the year. Production for the first eight months of 1935, however, before the new models were introduced,

was 28 per cent more than for the same period of the preceding year or greater than the production for the entire year of 1934. Total automobile production for 1935 was about 45 per cent greater than for 1934.

Total building construction awards for 1935 were 19.5 per cent more than for 1934. This rise was due primarily to the gain in private building operations.

## South Ohio River Steel Output Rises

**C**INCINNATI, Feb. 4.—The market pace in this area has about reached the 1935 peak. Early in the month demand for pig iron was at a low rate, but in the past two weeks interest in ordering has tended upward. Bookings are now averaging about 1300 tons a week, but large orders are lacking. Shipments against contracts are unusually heavy as melters seek to get out all iron under order. Foundry operations, particularly among automotive, stove and machine tool melters, have a conservative upward trend. General jobbing foundries, however, are not receiving business at the same rate as specialty plants.

Specifications against foundry coke contracts are heavier, January averages being comparable to the high December levels. Cold weather is stimulating domestic

coke sales, but prices are unchanged.

Renewed automotive interest in finished sheets raised rolling mill operations to slightly better than 90 per cent of capacity during the past week. In addition, makers of electric refrigerators are bidding for substantial tonnage recognition. Production is in keeping with demand and no backlogs are being accumulated. Prices are steady despite some agitation for increases.

The old materials market has almost reached an impasse. Mills refuse to purchase at higher price levels, while dealers, sensing an early need for scrap, insist on increased figures. Weekly ordering is in small lots for current needs. Most of the activity comes from dealers who are speculating or are covering against old contracts.

The Inland Steel Co., Chicago, recently issued the fifth edition of its handy booklet designed to aid purchasing agents. Included in this booklet are gage, weight and bundling tables for semi-finished, sheets, strip, bars, plates and structurals. The Inland department of inspection and metallurgy is also mentioned as making available to Inland customers a staff of trained experts who are always ready to confer and cooperate on any problem confronted in the use of steel. As a guide in ordering, specification information issued by the American Society for Testing Materials is also included.



# Refractories

The Great Lakes Line includes a wide range of refractory materials—Refracto Fire Clay of high sand-carrying capacity, low shrinkage—pure, strong, dense Newcastle Firestone of high softening point—Mica Schist—Ganister and Silica Grits—Fire Brick.

**Great Lakes  
Refractory Engineering  
Service**

*Use this technical advisory service—without obligation. It may help you solve some of your refractory problems.*

## GREAT LAKES FOUNDRY SAND CO.

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## Tantalum Discussed In Trade Booklet

**T**ANTALUM, a metallic element, the outstanding characteristic of which is complete resistance to acid corrosion, is fully discussed in a 48-page booklet recently published by the Fansteel Metallurgical Corp., of North Chicago, Ill. An old metal, tantalum was not successfully produced commercially, however, until Dr. Clarence W. Balke, director of research of Fansteel, took up active research on the metal in 1920. Even today the production is attended by many difficulties, since it must be produced

with a purity better than 99.9 per cent, its melting point is greater than that of any available crucible in which it might be contained, and almost no reagent can dissolve it. The entire production of tantalum and the highly specialized processes employed are developments of the Fansteel Research Laboratory.

According to the Fansteel Co., in every case where tantalum has been used either to improve existing equipment or to develop new processes, it has demonstrated its superiority and economy in one of the following ways: better product, elimination of impurities; cheaper product, lowered maintenance; lowered operating costs and operation performance otherwise impractical.

Included in the publication are discussions of the applications of tantalum, which include heat transfer areas, boundary surfaces and areas exposed to acids and oxidizing gases, regulating and control equipment, production equipment for halogens and their compounds, surfaces subjected to erosion under severely corrosive conditions, tantalum pen parts, tantalum in electronic tubes, tantalum alloys, ferro-tantalum and ferro-columbium, tantalum carbide and columbium. The booklet also deals with the properties of the metal including mechanical, thermal conductivity, electrical, magnetic susceptibility, electro-chemical and chemical, and is concluded with several tables.

## Bethlehem Completes New Welfare Building

(CONCLUDED FROM PAGE 49)

versing the operation. Also, each room is provided with the necessary forced-draft ventilators and draft shields to protect the men while under the showers.

An outstanding feature is the method employed in heating the water used in the showers and wash fountains. It is automatic in operation and uses live steam as the heating medium. As water is drawn in either wash fountain or shower a sufficient amount of steam is injected into the system to bring and keep the running water at a predetermined temperature.

Walls and ceilings are painted white, with black trim to the level of the windows. Each change of shift includes a janitor per floor who exercises supervision over the use of these quarters and washes floors and wash-room facilities at the end of each shift.



Adjoining the locker room is the wash room with its complement of toilets, showers and wash fountains, and above the doorway, the automatic injector system that provides a continuous supply of hot water at a constant temperature



# How to Cut Your Payroll Tax

(CONTINUED FROM PAGE 25)

minor consideration for the reason that the laws contain a further clause of this sort:

"In determining such a rating system it is hereby declared to be public policy that no rate of contribution on payrolls shall be less than one percentum."

Nevertheless, under either method, an employer may cut his tax 2 per cent and probably a bit more, because the states will certainly "load" their tax for enough to administer the vast unemployment organization.

Because no tax will drop below 1 per cent, it becomes a secondary matter whether "merit rating" laws are passed within three months. It is, however, highly important to have them before January, 1937, when the normal tax will become 2 per cent, as a minimum, in all states and more in some.

To cut the tax, then, becomes a matter of reducing lay-offs. Any employer who "regularizes" his employment will be rewarded. Here is the kernel of unemployment problems. But, as one authority has declared:

"The sooner an employer begins to work on the problem, the more certain it is that reductions in his labor turnover can be accomplished and that he will be eligible for a cut in his tax."

## Stabilization Requires Records

Stabilization is not impossible. It is, however, difficult — requiring, first of all, the determination to do it, and, secondly, adequate records of employment. Not much can be accomplished until you have worked out complete records of labor turns. Without records, you will be guessing. For 35 or 40 years the Eastman Kodak Company has controlled lay-offs, adjusting an exceedingly seasonal flow of goods into consumption into regularity of factory operation. Procter & Gamble, with soaps, have done an outstanding job in this direction, chiefly by calculating in advance the year's consumption of soap and then manufacturing one-twelfth of that quantity each month and shipping

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the excess to warehouses scattered over the country at spots where, ultimately, soap will be wanted.

Well-known concerns have used the following suggestions in their effort to "stabilize" employment of their workers:

1. Transfer employees from one task to another, rather than to lay men off when their particular work is done.
2. Letting out on contract short-time jobs, rather than to take on extra men for brief intervals. This method keeps casual workers and short-time employees off payroll, while yet getting the work done when required.
3. Changes in sales policies, such as by offering special discounts or long dating, so that goods will flow in more even distribution throughout year.
4. Expanding selling into new territories where seasons dovetail with established markets.
5. Reducing variety, number of patterns, number of models, etc., of goods manufactured.
6. Increasing variety, etc., or adding new products to line.
7. Adjusting working hours, staggering hours or days or weeks, so as to balance working hours and reduce peak load per day, week, or month.

Or, to be yet more specific with suggestions, we shall list the rules of two companies, General Electric and Leeds & Northrup. They have experimented for years with this baffling problem in management and undoubtedly have invested a large sum in "trial and error." Yet,

for the mere reading, another manufacturer may pick up, ready-made, a proven plan which a bit of adaptation will fit into his business.

## Rules for Stabilization of Employment in the General Electric Co.

### A. When business is increasing.

1. Increase the working force by adding employees as slowly as possible.
2. Increase the number in especially busy departments by transfers from other departments.
3. Resort to over-time in particular departments, and generally in the whole plant, before increasing the number of workers.
4. Postpone plant renewals and maintenance work as much as possible, and, for such work, employ men already on the payroll.

### B. When work begins to fall off.

1. Cease hiring at once.
2. Cut out all possible over-time and bring departments down to the normal week.
3. Transfer workers from slack to busier departments.
4. Stimulate the sales department to work for cooperation from customers to get business for future delivery, etc.
5. Manufacture standard goods for stock up to — months' shipments, based on average of the last three years of sales and adjusted to expectations for the next two years.
6. See that stocks at all factory and





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 forated metal products of the better quality.  
**DIAMOND MANUFACTURING CO.**  
 Wyoming, Penna.  
 Sales Representatives in all principal cities.

district warehouses are brought up to this maximum.

7. Use men on maintenance and repair work in order to bring the plant and all equipment up to a high standard.

8. Cut the normal week as generally and as gradually as possible by departments (down to 50 per cent of the normal week).

9. Proceed with construction of increased plant facilities previously planned, using our own men as far as possible.

10. Drop first: New employees with less than a year of service, single people with no dependents and those who are most easily spared; always with not less than one week's notice.

11. In accordance with our custom, established for some time, employees should be told whether it is a temporary lay-off due to lack of work or a permanent lay-off. In every instance of permanent lay-off, the usual compensation, if any, should be paid depending upon the character of work, age, length of service, etc.

#### Regularizing Methods of the Leeds & Northrup Company

1. Within limits, hours are adjusted to business volume in order to prevent over-hiring. If incoming business exceeds what can be handled with a normal productive force in the company's normal 44-hour week, over-time is resorted to on the ground that variation of working hours is more defensible than taking on and laying off people with each swing of business conditions. Additional workers, if the increase appears to be permanent, are taken on gradually and the costs of

over-time thereby reduced. If and as business declines to normal, hours are reduced to normal.

Then, if business drops below normal—

2. Standard articles are manufactured for stock, substantial financial reserves for this purpose having been set aside in time of prosperity.

## Steel Castings— Properties and Design

(CONTINUED FROM PAGE 33)

considerable was said about design, and its effect. It is not necessary, therefore, to repeat. It is true, however, that it is vital to the progress of steel castings that this field of investigation be fully explored by a cooperative effort on the part of foundrymen and engineering designers.

### Molds and Cores

Any investigation of molds and cores, and their effect upon castings, resolves itself into two parts: First, the materials of which the molds and cores are made, and, second, the actual methods adopted in making the molds from such materials.

When the casting is poured there

are so many effects on the liquid metal itself from each of these that molding has come to be regarded as more of an art than as an exact science. A skilled molder having an understanding of these effects, and a knowledge gained by experience of how to control them and prevent them from being harmful, is at a premium as a workman.

Various investigations of the past few years have uncovered a legion of facts on the effect of sand molds and cores, and provided explanations for many of the troubles which beset the foundryman. It is easy to see what an immense field for research is opened up by considering the requirements for a satisfactory mold to receive molten steel. These requirements are as follows:

(1) The mold must be composed of material so plastic as to receive and retain faithfully the impression of the pattern.

(2) It must be made from a material sufficiently refractory to withstand, without dangerous fusion, the tremendously high temperature of molten steel.

(3) The sand used must be porous, or permeable to gases to a high degree, so that the gas which is formed and greatly superheated during pouring can pass freely through the body of the mold instead of backing up into the liquid metal and causing unsoundness.

(4) The mold must be so strong as to resist the erosive action of a stream of hot liquid steel, and also strong enough to carry, without distortion, the weight of metal imposed on the mold faces.

(5) At the same time, the mold must be sufficiently weak to permit the casting on cooling to contract without offering undue resistance. Otherwise, cracking of the casting is certain to ensue.

Some of these requirements will appear so apparently contradictory that the reader will rightly come to the conclusion that a satisfactory mold in many cases must be in the nature of a compromise.

In arriving at a satisfactory compromise, however, many factors have to be considered. These factors are the size and thickness of section of the casting, its general contour and liability to cracking, the grain size and grain shape of the sand used, the type of bonding

material used to obtain plasticity, the ease of ramming, and the behavior of the sand when subjected to heat, that is, whether it will weaken and present easy contraction at the correct time, or harden greatly and tear the contracting casting apart.

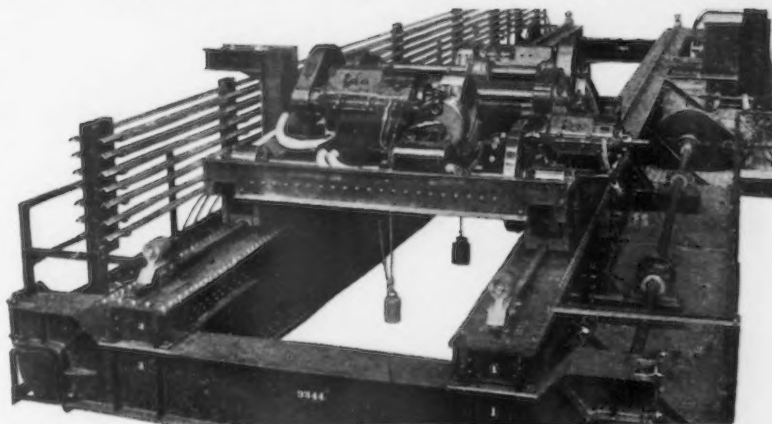
The sand used for what is called green sand molding is decidedly spherical in grain shape, thus insuring the greatest permeability to gases. The distribution of bond over the sand grains is important, so as to get maximum bonding effect with the least possible blockage of inter-granular space.

As against the material demands made on the mold sand, there are numerous conditions to be considered in the method by which the molds are produced. Apart from the case of very small castings, it is customary to use two grades of sand, one for facing the mold and the other for backing up and filling the rest of the flask space. The relationship between these two parts of the mold is important. The facing sand needs to be so constituted as to resist the erosion of the stream of hot metal, and it must also be sufficiently refractory to withstand the very high temperatures used.

During the process of pouring, however, large quantities of gaseous matter are produced, an outlet for which must be freely available. A backing sand, therefore, must be so open as to allow of such quick passage of gases as will prevent the building up of pressure in the body of the mold and the consequent risk of blowing back into the mold cavity when it is wholly or partially filled with liquid steel.

Quite a large part of the artisan skill of the good molder is associated with the appreciation of this one fact, and the assisting of the natural porosity of the sands in use by artificial venting as and when necessary. The porosity of the resulting casting and many times the presence of large blow cavities are even more often the result of shortcomings in the mold itself than due to an incorrect condition of the metal. Research on this phase of steel founding has before it the object of not only better materials for the construction of the mold, but a better and more efficient use of them in order to obviate as far as possible any ill effects on the metal of the cast-

## THEY COULDN'T AFFORD A SHUTDOWN



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ing because of the gases which are inevitably produced.

### Heat Treatment

This operation performs a two-fold service in the case of steel castings, first, the rejection or removal of strains set up by contraction, and, second, the refining of the crystalline structure by replacing the coarse acicular condition by one more homogeneous and finer in character, which results in an increase in physical properties.

At one time straight annealing or normalizing constituted about the limit of heat treatment as applied to most steel castings. A fear existed, often totally unfounded, that castings would not withstand satisfactorily a very quick cooling, such as quenching in oil or water from above the critical ranges of the material used. This, of course, constituted a fatal limitation to the obtaining of physical properties in any way comparable with those common to heat treated and worked steel. It is now known that much more intensified heat treatment can be applied safely to a large number of steel castings, and every type of treatment is common practice today in the modern steel foundry.

Alloy steels, of course, rely very largely on adequate heat treatment if the benefits of the alloy content

are to be made available in further conditions, and investigation into the response to various thermal treatments for both plain carbon and alloy steels in the cast form is constantly proceeding.

## Van Stoning and Bending Pipe

(CONCLUDED FROM PAGE 36)

making coils of pipe in sizes up to 6 in. and of any diameter.

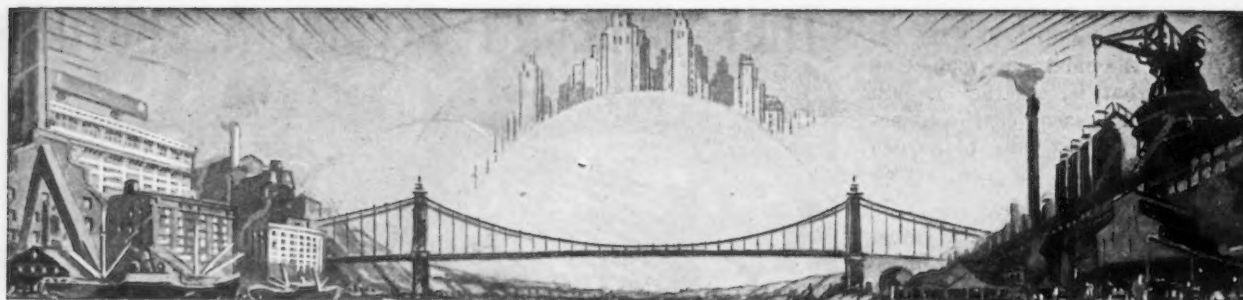
This plant is completely equipped with up-to-date welding apparatus, especially designed for all types of welding, either by the electric arc or acetylene methods on all kinds of metals such as carbon steel, alloy steel or any weldable non-ferrous metal.

### Natural Gas Pipe Cutting Machine

Another unique setup is an automatic pipe cutting machine with a cutting torch using natural gas. The pipe is slowly revolved as it sets on two 8-in. rolls, close together and motor-driven. The torch sets in a stationary head and cuts as the pipe revolves.

The testing facilities are adequate to test fabricated piping when necessary to 10,000 lb. per sq. in. hydrostatic pressure.





## Plant Expansion and Equipment Buying

### Machine Tool Activity Encourages the Industry

**W**HILE there has been no marked change in the general level of machine tool demand during the past week, the industry is nevertheless characterized by a spirit of encouragement. Inquiries have increased and their ability is such as to develop an assurance of considerable increase in demand shortly. The general impression is that February will show a substantial gain over January.

Machinery closures in the automobile industry have been slow the past week, but there is a large volume of business about to "break." The die-building program, which is expected to be active for six months of this year, instead of three months last year, will call for considerable tool replacement and additions.

#### ◀ NORTH ATLANTIC ▶

**American Cyanamid & Chemical Corpn.**, 30 Rockefeller Plaza, New York, has plans for new works at Joliet, Ill., for production of sulphuric acid and allied products. Cost over \$250,000 with equipment. Construction will be carried out by Chemical Construction Corpn., first noted address, an affiliated organization.

**Signal Supply Officer**, Army Base, Brooklyn, asks bids until Feb. 17 for manhole tops, including frame and lid (Circular 124); until Feb. 21, 560,000 ft. wire (Circular 125), and 91,700 ft. of cable and 67 reels (Circular 125).

**Greenwich Village Plumbers' Supply Co., Inc.**, 38 Carmine Street, New York, has leased building at 537-39 West Broadway for new shop, including pipe fitting and cutting departments, etc.

**Canada Dry Ginger Ale, Inc.**, 122 East Forty-second Street, New York, plans new mechanical bottling works, storage and distributing plant at Atlanta, Ga. Cost over \$50,000 with equipment. Russell G., and Walter M. Cory, 30 Church Street, New York, are architects and engineers.

**Quartermaster Supply Officer**, Army Base, Brooklyn, asks bids until Feb. 10 for galvanized rigid steel conduit, lead-covered cable, thermostatic water controllers, transformers, and electric storage water heaters (Circular 195).

**Middletown Brewing Co.**, Middletown, N. Y., has plans for new multi-story brew-house, mechanical bottling works, tank building and other units. Cost over \$150,000 with equipment. Whitman S. Wick, 15 King Street, is architect in charge.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Feb. 11 for one motor-driven, portable turret track-turning machine (Schedule 7108), one motor-driven shearing, gap splitting and squaring machine (Schedule 7129) for Brooklyn Navy Yard; one motor-driven light-duty, geared-head engine lathe (Schedule 7132) for White Plains, N. Y., Naval Station; until Feb. 14, 18,500 ft. of electric cable (Schedule 7109) for Brooklyn and Mare Island yards.

**Continental Oil Co.**, 60 East Forty-second Street, New York, has let general contract to Darby Corp., 5534 Crestwood Avenue, Kansas City, Kan., for new bulk oil storage and distributing plant at Lake Charles, La., where 12-acre tract recently was acquired, comprising a 500-ft. dock, with loading and unloading equipment, pumping station steel tanks and other units. Cost over \$150,000 with equipment.

**United States Engineer Office**, First District, New York, asks bids until Feb. 11 for six alloy cast steel track sections, valve treads, completely machined for Troy, N. Y. (Proposal 288).

**Commanding Officer**, Picatinny Arsenal, Dover, N. J., asks bids until Feb. 10 for starting equipment for 300-hp. induction motor (Circular 208); until Feb. 26, one power press, one planetary thread milling machine, one special drilling machine, one machine for manufacture of detonator caps, and two electric furnaces (Circular 209).

**Borough Board of Education**, Hohokus, N. J., plans manual training department in new two-story junior and senior high school, for which general contract has just been let to E. M. Johnson, Inc., 706 Bergen

Avenue, Jersey City, N. J. Cost over \$200,000 with equipment.

**Crystal Bottling Co.**, 411 North Washington Street, Wilkes-Barre, Pa., plans one-story addition, primarily for storage and distribution. Cost close to \$30,000 with equipment.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Feb. 11 for five sets of air compressor units and spare parts (Schedule 7124); until Feb. 14, angle and globe valves for air service (Schedule 7161) for Philadelphia and Brooklyn navy yards.

**Constructing Quartermaster**, Carlisle Barracks, Carlisle, Pa., asks bids until Feb. 11 for 21,200 ft. lead-covered cable (Circular 31).

**Commanding Officer**, Frankford Arsenal, Philadelphia, asks bids until Feb. 11 for one extra-heavy gate valve (Circular 319); until Feb. 14, radial ball bearings (Circular 313).

#### ◀ NEW ENGLAND ▶

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Feb. 11 for one motor-driven automatic screw machine for Newport, R. I., Navy Yard (Schedule 7083); 132 seamless steel flasks for compressed air service for Portsmouth, N. H., and Mare Island yards (Schedule 7088).

**Board of Education**, East Haven, Conn., plans manual training department in new two-story high school, for which revised plans are being drawn. Bids will be asked soon on general contract. Cost over \$200,000 with equipment. R. W. Foote, New Haven, Conn., is architect.

**Boston Marine Works**, 2 New Street, Boston, has filed plans for new one-story machine shop for special mechanical service.

**Florence Stove Co.**, 205 School Street, Gardner, Mass., manufacturer of domestic oil and gas pressure stoves, parts, etc., will soon begin superstructure for two-story addition, 150 x 300 ft., primarily for storage and distribution. Cost over \$80,000 with equipment. Frank D. Chase, Inc., 307 North Michigan Boulevard, Chicago, is architect and engineer.

**Commanding Officer**, Springfield Armory, Springfield, Mass., asks bids until Feb. 14 for two motor-driven speed lathes (Circular 106), one thread chaser grinder and one drill grinder (Circular 107); until Feb. 17, one double-end automatic milling and centering machine, complete with motor-drive, cams, holding fixtures, etc. (Circular 111), two forging furnaces with automatic temperature control (Circular 114).

**United States Engineer Office**, First District, 39 Whitehall Street, New York,



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The Columbium in this rod assures corrosion-resistant welds retaining all the advantages of the original stainless steel. Where a columbium- or titanium-bearing base metal is used, the usual heat treatment is completely avoided.

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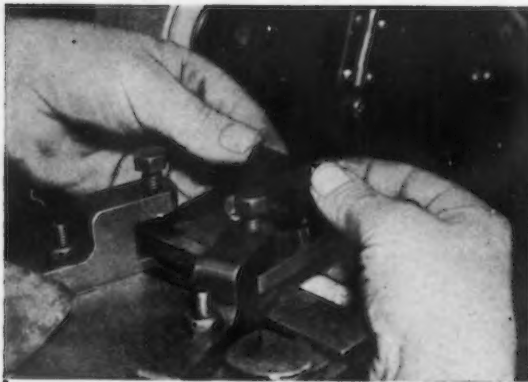
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GAGE BLOCKS AND ACCESSORIES

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FORD MOTOR COMPANY  
Johansson Division Dearborn, Michigan

asks bids until Feb. 10 for one motor-driven bench lathe for Waterbury, Vt. (Circular 268).

### ◀ BUFFALO DISTRICT ▶

**Eastman Kodak Co.**, Kodak Park, Rochester, N. Y., has let general contract to Ridge Construction Corp., Rochester, for one and multi-story additions to factories Nos. 105 and 126. Cost over \$100,000 with equipment.

**John Morrell & Co.**, 60 Allen Street, Rochester, N. Y., meat packers, have asked bids on general contract for new one-story plant unit on Erie Boulevard, partly for storage and distribution. Cost about \$40,000 with equipment. Company headquarters are at Ottumwa, Iowa. H. Peter Henschien, 59 East Van Buren Street, Chicago, is architect and engineer.

**Eastman Machine Co.**, 779 Washington Street, Buffalo, manufacturer of cloth-cutting machinery, parts, etc., has plans for extensions and improvements in machine shop. Cost over \$30,000 with equipment. H. E. Plumer & Associates, Inc., 775 Main Street, is architect.

**Vacuum Gas Burner Corp.**, Olean, N. Y., has been organized, capital \$50,000, by Robert A. Conkling, Jr., 421 York Street, Olean, and W. C. Conkling, Portville, N. Y., to manufacture gas burners and equipment, and parts.

### ◀ OHIO AND INDIANA ▶

**Vienna Brewing Co.**, Sycamore and Elliott Streets, Cincinnati, has plans for two-story and basement addition, 69 x 105 ft., primarily for a mechanical bottling works. Cost about \$55,000 with equipment. O. H. Bardon, Traction Building, is architect.

**Champion Paper & Fibre Co.**, Hamilton, Ohio, manufacturer of paperboard and other paper products, plans new pulp and paper mill near Houston, Tex., to produce pulp under a new process. Entire project will cost close to \$3,000,000, of which about \$550,000 will be used for buildings, \$2,000,000 for machinery and other equipment, \$300,000 for an electrolytic plant, \$200,000 for water supply system with pumping machinery, water-softening equipment, etc., and miscellaneous units. Financing is being arranged. Reuben B. Robertson is executive vice-president.

**Interlake Iron Corp.**, 2401 Front Street, Toledo, Ohio, has approved plans for one-story addition, primarily for production of iron paving plates, a new line of output for company. Cost about \$100,000 with machinery.

**Contract Welders, Inc.**, 4829 Lexington Avenue, N. E., Cleveland, has leased one-story building at 2547 East Seventy-ninth Street, about 12,000 sq. ft. floor space, for new welding works and will remove to new location and increase capacity.

**Contracting Officer**, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Feb. 10 for two steel house

assemblies, six floodlight bridge assemblies (Circular 517), oil tank flanges, eye bolt assemblies with elevator hinge arm attaching, and 40 wing plate assemblies (Circular 506); until Feb. 12, 70 dial type reversible test indicators (Circular 505); until Feb. 13, 2670 socket wrenches (Circular 526), 216 micrometer outside calipers (Circular 529); until Feb. 14, 20 oleo units landing gear shock struts (Circular 504), 28 floodlight lamp assemblies and 117 field outline lamp assemblies (Circular 522); until Feb. 21, about 77,000-ft. steel tape armored cable (Circular 525).

**Board of Public Works**, City Hall, Fort Wayne, Ind., asks bids until Feb. 21 for additions to municipal electric power plant for expansion in steam-generating division and high-tension bus structures. Cost about \$145,000 with equipment. Froehlich & Emery Engineering Co., Second National Bank Building, Toledo, Ohio, is consulting engineer.

### ◀ WASHINGTON DIST. ▶

**Superintendent**, St. Elizabeth's Hospital, Washington, asks bids until Feb. 10 for one portable two-stage gasoline engine-driven air compressor.

**Gunther Brewing Co., Inc.**, 1211 South Conkling Street, Baltimore, will take bids early in spring for one-story addition for storage and distribution. Cost over \$40,000 with equipment. Charles H. Osborn, 222 West Franklin Street, is engineer.

**General Purchasing Officer**, Panama Canal, Washington, will receive bids until Feb. 14 for 57,000-ft. wire rope, cast steel wire rope, plow steel wire rope, towing wire rope, galvanized steel seizing strand, bronze wire, 15,000-lb. soft steel wire, 26,000-lb. common wire nails, 7000-lb. wire finishing nails, 13,000-lb. galvanized steel wire finishing nails, 4000-lb. galvanized steel common wire nails, galvanized steel or boat nails, tram nails, globe valves, brass pipe, copper pipe, six 25-ton screw jacks, steel shelving units and other equipment (Schedule 3123).

**Maryland Paper Products Co.**, 1200 South Eutaw Street, Baltimore, has acquired part of former plant of Knabe Piano Co., Cross, West and Eutaw Streets, and will remodel for new paper-converting plant, including storage and distributing division. Cost over \$40,000 with equipment.

**Division of Purchase, Sales and Traffic**, Department of Agriculture, Washington, asks bids until Feb. 11 for three portable electric lighting plants with accessory equipment (Proposal 3755).

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Feb. 11 for chain hoists (Schedule 7117), one motor-driven drill grinder (Schedule 7100), water gages (Schedule 7113); until Feb. 14, seamless copper tubing (Schedule 7155), coil chains and weldless chain (Schedule 7105), brass and steel bolts and nuts (Schedule 7116) for Eastern and Western navy yards; 7350 hoisting bands for 500-lb. demolition bombs (Schedule 7115) for Yorktown, Va., yard; until Feb.

18, chain and flight assemblies, and sprockets (Schedule 7137) for Washington yard.

### ◀ SOUTH ATLANTIC ▶

**Carolina Aniline & Extract Co.**, 1122 South Boulevard, Charlotte, N. C., has acquired tract at 2300 South Boulevard for new plant, comprising main one-story unit and adjoining structures. Cost about \$50,000 with equipment. Later it is proposed to build five or more additional one-story extensions, to cost about \$150,000 including machinery. G. S. McCarty is head.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Feb. 11 for two hand-operated, turret-type, multiple portable punches for Charleston, S. C., Navy Yard (Schedule 7130).

**Carey Citrus Products Corp.**, Plant City, Fla., plans rebuilding citrus fruit packing plant recently destroyed by fire. Loss close to \$100,000 with conveyors, loaders and other mechanical equipment. G. A. Carey is head.

**Bureau of Yards and Docks**, Navy Department, Washington, has let general contract to Virginia Engineering Co., Nelson Building, Newport News, Va., for machine shop, hangars with repair and reconditioning facilities, and equipment storage and distributing buildings at Naval Air Station, Pensacola, Fla. Cost \$1,185,000.

### ◀ SOUTH CENTRAL ▶

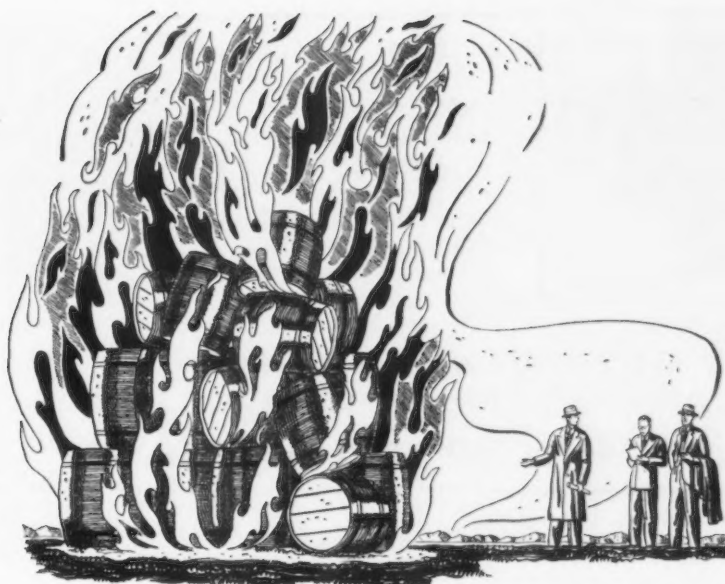
**Director of Purchases**, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Feb. 14 for one 19-ton crane, with shovel and dragline, and clamshell and dragline bucket; one 2-cu. yd. shovel with dragline and bucket and one similar 1½-cu. yd. shovel for Chickamauga Dam; until Feb. 18, main control room switchboards, terminal boards, generator exciter boards, hydraulic gage boards and accessories, and transformers and auxiliary equipment for Norris hydroelectric power plant.

**Panama Refining Co.**, Overton, Tex., has acquired about 20 acres at McCoy Station, Rodessa, La., oil field district, for new oil refinery, with storage and distribution facilities, including steel tanks. Company will remove plant from first noted place to new location and increase capacity. Martin Flood is chief engineer.

**United States Engineer Office**, Second District, New Orleans, asks bids until Feb. 10 for four 2500-lb. and four 1200-lb. cast steel anchors (Circular 397).

**Russell Engineering Co.**, E. P. Russell, 1219 Porterfield Street, Pittsburgh, head, has acquired former plant of Roane Iron & Coal Co., Rockwood, Tenn., and will remodel for production of lime and lime by-products. Installation will include furnace equipment, mechanical-handling and other machinery. Cost close to \$40,000.

**United States Engineer Office**, Vicksburg, Miss., asks bids until Feb. 18 for 5000-lb. low carbon electric welding rod (Circular



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 Lumbermen's Mutual Insurance Co., Mansfield, Ohio  
 Michigan Millers Mutual Fire Insurance Co., Lansing, Mich.  
 Mill Owners Mutual Fire Insurance Co. of Iowa, Des Moines, Iowa  
 Millers Mutual Fire Insurance Assoc. of Illinois, Alton, Ill.

Western Millers Mutual Fire Insurance Co., Kansas City, Mo.

Millers Mutual Fire Insurance Co., Fort Worth, Texas  
 Millers Mutual Fire Insurance Co., Harrisburg, Pa.  
 National Retailers Mutual Insurance Co., Chicago, Ill.  
 Northwestern Mutual Fire Assoc., Seattle, Wash.  
 Pennsylvania Lumbermen's Mutual Fire Insurance Co., Phila., Pa.  
 Pennsylvania Millers Mutual Fire Insurance Co., Wilkes-Barre, Pa.  
 United Mutual Fire Insurance Co., Boston, Mass.





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177); until Feb. 21, two manganese steel impellers (Circular 180); until Feb. 25, 10,400-lb. structural steel buttonhead rivets (Circular 182).

### ◀ WESTERN PA. DIST. ▶

**Fisher Scientific Co.**, 711-15 Forbes Street, Pittsburgh, manufacturer of precision instruments and equipment, laboratory supplies, plans two additions on adjoining site, seven stories and five stories respectively. Cost over \$100,000 with equipment.

**Duquesne Brewing Co.**, Twenty-second and Mary Streets, Pittsburgh, has let general contract to Navarro Corp., 6219 Broad Street, for addition for loading, storage and distribution. Cost over \$45,000 with equipment. C. R. Geisler, 337 Boulevard of Allies, is architect.

**Consolidated Lamp & Glass Co.**, Coraopolis, Pa., manufacturer of electric lighting fixtures, parts, etc., will recondition and improve plant, with installation of equipment for replacements. Factory has been closed about four years and will resume operations early in March. R. J. Watson is secretary and treasurer.

### ◀ SOUTHWEST ▶

**Longwear Paint & Varnish Co.**, 301 Broadway, Kansas City, Mo., has taken bids on general contract for new one-story plant, 40 x 100 ft. Cost about \$40,000 with equipment. Clifton Sloan, Ninth Street and Baltimore Avenue, is architect.

**City Council**, Iola, Kan., plans extensions and improvements in municipal electric power plant, to include turbo-generator unit and accessories, boilers and other equipment; extensions will be made in distribution system. Cost about \$280,000 with equipment. Paulette & Wilson, Farmers' Union Building, Salina, Kan., are consulting engineers.

**Root Refining Co.**, El Dorado, Ark., plans rebuilding part of gasoline refinery recently destroyed by fire. Loss over \$70,000 with equipment.

**Crossett Lumber Co.**, Crossett, Ark., will ask bids in 30 to 60 days for new pulp and paper mill for production of kraft paper stocks, with machine shop, steam power house and other mechanical departments. Fund of \$4,000,000 will be available for buildings and machinery, secured through RFC financing a few months ago.

**Common Council**, Hooker, Okla., plans extensions and improvements in municipal electric power plant and waterworks, including additional equipment. Cost about \$60,000.

**Constructing Quartermaster**, San Antonio, Tex., plans extensions and improvements in local airport and flying field, including hangars, repair and reconditioning shops and other structures. Fund of \$77,000 has been authorized.

**Common Council**, Buffalo, Tex., asks bids until Feb. 11 for pumping machinery and

auxiliary equipment, elevated steel tank and tower and accessories for municipal water system. Fund of \$32,000 has been arranged. Southwest Engineering Co., Littlefield Building, Austin, Tex., is consulting engineer.

**Texas Co.**, Houston, Tex., plans extensions and improvements in asphalt refining works at Port Neches, Tex., including five steel tanks and other equipment.

**Missouri Pacific** has been allowed following expenditures for machine tools during 1936: Missouri Pacific Railway, \$117,000; St. Louis, Brownsville & Mexico, \$5,660. List of tools to be purchased is not expected for several weeks.

### ◀ MICHIGAN DISTRICT ▶

**General Gas Light Co.**, Water Street, Kalamazoo, Mich., manufacturer of gas heaters and parts, gas-lighting equipment, etc., has asked bids on general contract for one-story addition, 160 x 200 ft., for manufacture, storage and distribution. Cost over \$70,000 with equipment. M. C. Billingham, Kalamazoo, is architect.

**Department of Public Works**, City Hall, Detroit, plans electric-operated pumping plant at West Jefferson Avenue and Rouge River in connection with new sewage disposal works and system, with power station and other mechanical units, to cost about \$7,000,000 with machinery. Fund of \$20,000,000 is being arranged for entire project, of which about \$9,000,000 will be secured through Federal aid. Work on pumping plant is scheduled to begin next summer.

**Fisher Body Corp.**, General Motors Building, Detroit, a unit of General Motors Corp., has let general contract to J. A. Utley, 6031 Mansur Street, for new die and press plant at Grand Rapids, Mich., where 80 acre tract was recently acquired. Contract calls for completion of buildings in about three months. Installation of presses and other machinery will be carried out by company engineering department. Cost close to \$6,000,000 with machinery.

**Public Lighting Commission**, 174 East Atwater Street, Detroit, plans extensions and improvements in municipal electric power plant, used for street-lighting and other service, including installation of new equipment. Portion of fund of \$580,000 approved by City Council, will be used for work.

### ◀ MIDDLE WEST ▶

**United States Gypsum Co.**, 300 West Adams Street, Chicago, manufacturer of building products, wallboard, etc., plans one-story addition to mill at Greenville, Miss., 150 x 230 ft. Cost over \$150,000 with equipment.

**Signal Corps Procurement District**, 1819 West Pershing Road, Chicago, asks bids until Feb. 11 for 15,000 ft. twisted rubber-covered wire, and five testing cabinets (Circular 36).

**Minneapolis-Honeywell Regulator Co.**, 2727 Fourth Avenue South, Minneapolis, Minn., manufacturer of heat regulators, parts, etc., has let general contract to C. F. Haglin & Sons Co., National Building, for six-story addition, 75 x 196 ft. Cost about \$200,000 with equipment. E. J. Prondzinski, Pence Building, is architect.

**Common Council**, New Market, Iowa, plans new municipal electric power plant. Special election has been called Feb. 11 to vote bonds for \$55,000.

**Board of Regents**, University of Minnesota, Minneapolis, has plans for one-story addition to mechanical shop and equipment storage and distribution building on university campus. Cost about \$45,000 with equipment. Standard Construction Co., 215 South Sixth Street, is low bidder on general contract. Pillsbury Engineering Co., 1200 Second Avenue South, is consulting engineer.

**A. Finkl & Sons Co.**, 2011 North Southport Avenue, Chicago, manufacturer of forgings, etc., has asked bids on general contract for new one-story forge shop, 89 x 225 ft. Cost over \$100,000 with equipment. Pereira & Pereira, 333 North Michigan Boulevard, are architects.

**Board of Education**, Clear Lake, Iowa, plans manual training department in new three-story and basement high school, for which general contract has been let to Ernest Anderson, Clear Lake. Cost about \$160,000. Gausman & Moore, First National Bank Building, St. Paul, Minn., are architects.

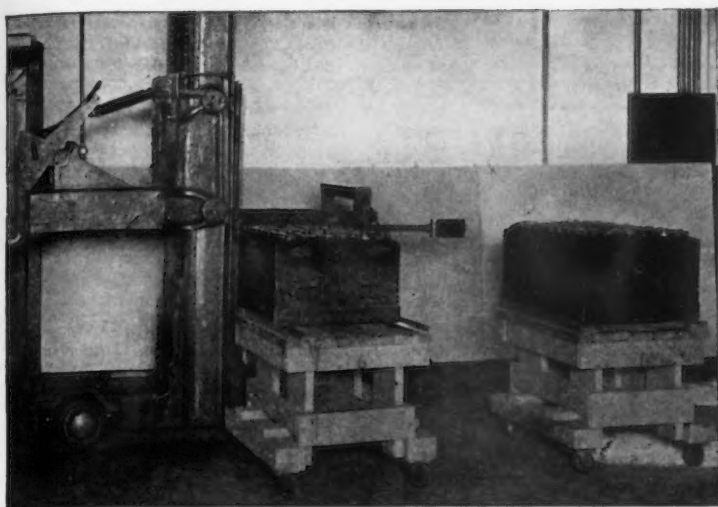
**City Council**, Benson, Minn., asks bids until Feb. 10 for oil engine-generating unit and auxiliary equipment for municipal electric power plant. Burlingame & Hitchcock, Sexton Building, Minneapolis, are consulting engineers.

**Murphy Diesel Co., Ltd.**, 1910 South Fifty-third Street, Milwaukee, manufacturer of industrial Diesel engines, has leased former plant of Milwaukee Separator Co. at South Fifty-third and West Burnham Streets, containing 30,000 sq. ft., for manufacture of fuel systems and accessories and final assembly operations. Machine work will continue to be under contract with Wisconsin Motor Corp. Moyes J. Murphy is vice-president, chief engineer and general manager.

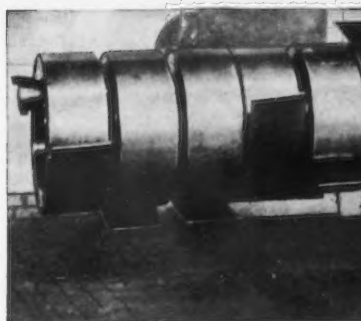
**Globe-Union Mfg. Co.**, 900 East Keefe Avenue, Milwaukee, manufacturer of roller skates, storage batteries, radio parts, etc., has leased former plant of Milwaukee Air Power Pump Co., 135 x 150 ft., one-story, adjacent, and will occupy it with laboratories and precision parts manufacturing. C. O. Wanvig is president of Globe company.

### ◀ PACIFIC COAST ▶

**Holly Sugar Corp.**, Colorado Springs, Colo., has approved plans for extensions and improvements in beet sugar mill at Hamilton City, Cal. Plant has been closed



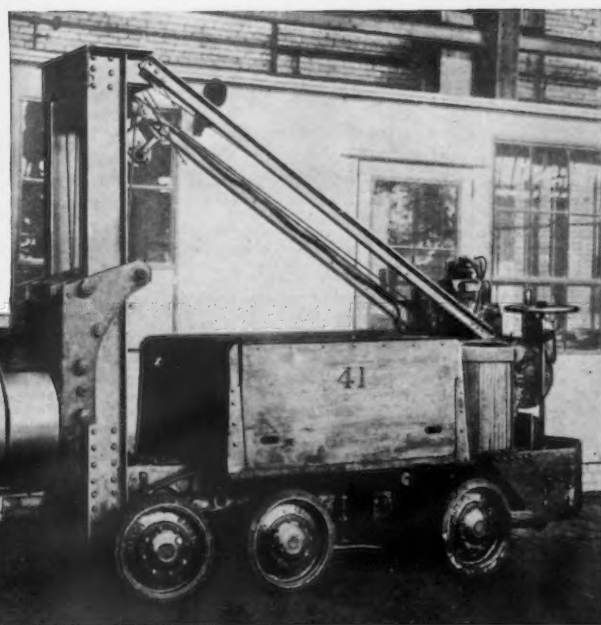
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The World's Largest Manufacturers of Storage Batteries for Every Purpose  
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for several years and will be remodeled and re-equipped. Cost about \$500,000 with machinery.

**Bureau of Reclamation**, Denver, asks bids until Feb. 17 for one  $\frac{3}{4}$ -cu. yd. dragline excavator and two dragline buckets for Humboldt, Nev., Project (Specifications 764-D).

**Federated Metals Corp.**, 2425 Hunter Street, Los Angeles, manufacturer of metal products, will soon take bids on general contract for two new plant units, each one-story, 80 x 24 ft., and 80 x 140 ft. Cost over \$85,000 with equipment.

**Edward Young**, 4402 Maynard Avenue, Seattle, has plans for new one-story machine shop, 24 x 55 ft. A traveling crane will be installed. Cost about \$25,000 with equipment. Howard H. Riley, Joseph Vance Building, is architect.

**Columbia Breweries, Inc.**, 2120 South C Street, Tacoma, Wash., has let general contract to J. W. Bailey Construction Co., Insurance Building, Seattle, for three-story addition, 42 x 172 ft., for mechanical-bottling division, storage and distribution. Cost about \$100,000 with machinery. E. J. Bresemann, Perkins Building, Tacoma, is architect.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Feb. 11 for one drill press, one band saw and one wood-working machine, all motor driven (Schedule 7102), one welding machine (Schedule 7098), one motor-driven vertical shaper (Schedule 7099), nine electric-operated drinking fountains and spare parts (Schedule 7091), one motor-driven universal die-sinking machine, vertical type, oscillating head (Schedule 7101); until Feb. 14, helical and other steel springs (Schedule 7110), one crystal-controlled standard frequency oscillation (Schedule 7126), high-speed twist drills (Schedule 7118) for Mare Island Navy Yard; motor-driven squaring shear (Schedule 7104), one stub-type lathe (Schedule 7107), one inspection unit, horizontal type (Schedule 7106), one 42-in. motor-driven, open-side metal-cutting planer (Schedule 7111) for San Diego Naval Station.

**Famous Cabinet Mfg. Co.**, 721 East Sixty-second Street, Los Angeles, manufacturer of cabinets, fixtures, etc., plans rebuilding part of plant recently destroyed by fire. Loss close to \$100,000 with equipment.

## ◀ FOREIGN ▶

**Imperial Chemical Industries, Ltd.**, London, England, has plans for several additional units to works near Johannesburg, South Africa, for production of cyanide of sodium and kindred products. Cost over \$800,000 with machinery.

**Tunstall Steels, Ltd.**, London, England, recently chartered with capital of £850,000 (\$4,250,000) by officials of Austin Motor Co., Ltd., London, manufacturer of automobiles and parts, has selected about 50 acres at Wolverhampton, England, for new plant for production of steel sheets and plates to be used by parent company, also a division for manufacture of steel forgings, stampings and kindred parts for automotive service. Cost close to \$1,500,000 with machinery.

**Electricity Commission**, Birmingham, England, has plans for extensions and improvements in municipal electric light and power plant in Hams Hall district, with installation of new turbo-generator units and auxiliary equipment for increase in present capacity. Extensions will be made also in transmission and distributing lines, with additional power substation facilities. Cost over \$2,000,000 with equipment.

**Peruvian Associated Gold Mines, Ltd.**, London, England, plans extensions and improvements in gold-mining properties in Peru, including installation of mining, mechanical-handling and refining equipment. Properties will be electrified. Fund of \$800,000 has been authorized for project.

**Northern Korean Paper Mfg. Co., Ltd.**, a subsidiary of Oji Paper Mill Co., Ltd., Shingishu, Korea, plans new paper and pulp mill at Kishu, Kankyo-Hokudo, Korea, to utilize timber properties in Northern part of Korea for pulpwood service. Costs over \$500,000 with equipment.

## TRADE NOTES

**Consulting Engineering Co.**, 1 Terminal Office Building, Carson Street, Pittsburgh, has been appointed representative of the Pennsylvania Pump & Compressor Co., Easton, Pa., in the Pittsburgh district. The management of the Consulting Engineering Co. consists of J. F. Tutein and T. G. McCann.

**Crosley Radio Corp.**, Cincinnati, has taken over a plant of the former Haynes Automobile Co. at Kokomo, Ind. The general overall length of the plant is 900 ft., with 500 ft. two stories in height, and the width of the entire plant is 75 ft. Employment has been provided for 1000 to 1400 persons a day, and production of radios has run as high as 3000 sets a day.

**Goddard & Goddard Co., Inc.**, Detroit, has appointed H. F. Rueter, 16905 Hilliard Road, Cleveland, as representative in the northern half of Ohio. E. G. Doran, 1618 West Fulton Street, Chicago, is now representing Goddard & Goddard Co. in Iowa, northern Illinois and northwest Indiana.

**Babcock & Wilcox Tube Co.**, Beaver Falls, Pa., has appointed Markham Supply Co., 310 South Michigan Avenue, Chicago, as general railroad sales representatives for Chicago, St. Louis, Kansas City, Omaha and Twin Cities territory. Lloyd R. Wells, formerly railroad sales representative of Babcock & Wilcox company, will continue in same capacity with Markham company in above mentioned territory.

**Quickwork Co.**, maker of rotary shear power hammers and other metal working machinery, formerly at St. Marys, Ohio, has moved to new plant at 900 North Spaulding Avenue, Chicago. In addition to regular lines, new establishment will also handle welded steel press frames, welded steel columns for power hammers and other welded rolled steel assemblies.

**Robbins & Robbins**, 504 Howard Avenue, New Orleans, have just been appointed district representatives by Struthers-Wells Co., Warren, Pa., manufacturer and engineer of steel and alloy steel equipment. Robbins & Robbins will cover Louisiana and Mississippi.

**Central Foundry Co.** has moved its Pacific Coast sales office from San Francisco, to 278 Fourth Street, Oakland, Cal. John Ponsaing, E. A. Keithley and K. P. Hughes will represent the company at this new office.

**Tower Manufacturing Corp.** will occupy new quarters at 563-565 Atlantic Avenue, Boston, after Feb. 1, 1936.

**Athos Steel Service**, Philadelphia, sheet steel distributor, has moved its office and warehouse to improved and more central quarters at corner of Twenty-third Street and Allegheny Avenue.

**Hansell-Elcock Co.**, Chicago, has removed general offices and drafting room to 3153 South California Avenue, Chicago.

**American Sales Co.**, Cincinnati, buyer, seller and liquidator of surplus stocks, has moved into new quarters at 1562 Harrison Avenue.

**Lapp Equipment Co.**, First National Bank Building, Pittsburgh, for several years sales agent in Pittsburgh-Tri-State area for Poole flexible couplings, manufactured by Poole Foundry & Machine Co., Woodbury, Baltimore, has added to its territory entire State of Ohio, excepting the immediate Cincinnati district. District office will be maintained in Rockefeller Building, Cleveland, in charge of G. H. Bales.

**Illinois Gear & Machine Co.**, 2108 North Natchez Avenue, Chicago, has purchased all machinery and equipment of the William Ganschow Co. Division of Gears & Forgings, Inc., in Chicago.

**Fletcher, Terry Co.**, Forestville, Conn., has purchased S. G. Monce, Inc., Unionville, Conn. S. G. Monce, Inc., was established in 1869 by Samuel G. Monce, inventor and patentee of first steel wheel glass cutter. Fletcher, Terry Co. was established in 1903.

**Detroit Rex Products Co.**, has opened new branch office at 201 North Wells Street, Chicago, to cover Wisconsin, Illinois and Missouri. G. P. Anstias, S. B. Crooks and C. L. Jung are in charge. Frank P. Cox will handle Alkali cleaners and strippers and will supervise activities of these cleaners from the Detroit office.

## FINANCIAL NOTES

**Scullin Steel Co.**, St. Louis, had a net loss during 1935 of \$450,546 after charges including depreciation and interest, the latter amounting to \$358,714. The 1934 loss was \$304,926. Gross sales for 1935 were \$631,898, compared with \$657,895 in 1934.

**A. M. Byers Co. and Orient Coal & Coke Co.**, Pittsburgh, in the fourth quarter had net loss of \$187,583 compared with net loss of \$210,442 in the preceding quarter, and net loss of \$220,230 in the fourth quarter of 1934.

**Gulf States Steel Co.**, Birmingham, in quarter ended Dec. 31 had net profit of \$119,350 after interest, depreciation, taxes, etc., compared with a net profit of \$58,433 in the preceding quarter, and a net loss of \$44,468 in the fourth quarter a year earlier. Earnings for the final quarter in 1935 equalled 43c. a share on 197,500 shares of no-par common stock after quarterly dividends on the company's 7 per cent preferred stock.

**National Steel Corp.** has declared regular quarterly dividend of  $37\frac{1}{2}$ c. a share. This dividend takes the place of the regular dividend of 25c. a share, plus an extra dividend of  $12\frac{1}{2}$ c. a share, which was declared during the past several preceding quarters. The dividend will be payable on Jan. 31 to stockholders of record on Jan. 20.

**Ludlum Steel Co.**, Watervliet, N. Y., reports an increase in sales for 1935 of 27 per cent as compared with total sales for the previous year. Net earnings after all charges including provision for Federal income tax, based on report of the company's auditors and therefore subject to audit by independent accountants, indi-



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To combat the rotting action of oil in the line Goodyear has developed a special non-porous, slow-aging, non-swelling tube stock that eliminates all danger of tube flaking off and clogging tools.

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**GOODYEAR WELDING HOSE**  
Highly flexible. Will not kink, or flatten under impacts. Non-flaking tube. Two types: Style M heavy duty and Wingfoot.

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cate a probable increase in earnings of approximately 40 per cent as compared with the previous year. This estimate does not include pro-rata earnings of subsidiary companies. At a recent meeting, the board of directors declared a dividend of 25c. per share on common stock, payable Feb. 15 to stockholders of record at the close of business on Feb. 5.

**Great Northern Iron Ore Properties**, at a meeting of the trustees, Jan. 15, declared a distribution of \$1 per share on its certificates of beneficial interest, payable Feb. 7, 1936.

## NEW TRADE PUBLICATIONS

**Optical Instruments.**—Gaertner Scientific Corp., 1201 Wrightwood Avenue, Chicago. Catalog L2, 80 pages, describing and illustrating spectrometers and accessories, X-ray spectrometers, spectroscopes, wavelength spectrometers, infra-red spectrometer and monochromator, interferometers, and other instruments.

**Inclinable Presses.**—Niagara Machine & Tool Works, Buffalo, N. Y. Bulletin No. 58-E, 34 pages. Illustrates and describes the Master Series A and improved line of standard inclinable presses. The many attractive illustrations include details, as well as inclinable machines for specialized production applications.

**Lathes.**—Pratt & Whitney Co., Hartford, Conn. Circular 419, announcing the new model C, 14 and 16-in. lathe, a simplified unit featuring unusual accuracy, rigidity and convenience. Complete specifications are included.

**Texrope Drives for Machine Tools.**—Allis-Chalmers Mfg. Co., Milwaukee. Bulletin No. 1259, 32 pages, covering 60 or more machine tool applications. These drives are fully standardized, a large number of ratios between 1 and 1 and 7 to 1 being available from stock. Stock service is also available in motor ratings from  $\frac{1}{2}$  to 100 hp., and special drives are furnished to specification from 1 to 2000 hp.

**Die Heads and Threading Machines.**—Geometric Tool Co., New Haven, Conn. Three bulletins, one of which is devoted to combination die heads, styles TR and TH, using tangent or circular chasers, and another to the EJ2 die head, a small solid adjustable tool for use where solid dies of round, button or other types are now employed. The third bulletin gives specifications for the company's new No. 12 threading machine.

**Arc Welders.**—Harnischfeger Corp., Milwaukee. New "Weld It Well" bulletin, 24 pages, covering complete line of P & H-Hansen arc welders from 50 to 800 amp., as well as welding fixtures and accessories. Condensed specifications and performance data are included.

**Arc Welders.**—Hobart Bros., Troy, Ohio. A "trip through the factory" booklet, 40 pages, with large, bleed page illustrations of various steps in the manufacture of the company's simplified arc welders.

**Arc Welding Accessories.**—Smith Welding Equipment Eastern Corp., Roslyn, Pa.

Four-page catalog section describing Amco-weld electrode holders, hand shields, helmets, lenses and other accessories.

**Machine Gas Cutting Equipment.**—General Welding & Equipment Co., Cambridge, Mass. Booklet giving details of the Geweco type K stationary automatic shape cutting machine.

**Hourglass Gear Shaper.**—Fellows Gear Shaper Co., Springfield, Vt. Illustrated circular giving details of new machine for cutting hourglass worms.

**Electric Hoists.**—Northern Engineering Works, Detroit. Bulletin EH-250 illustrating the company's 3 to 10-ton Hi-Lift hoists, furnished with hand or motor-travelled trolley. Low headroom, rolled steel construction, roller bearings, and bath lubrication are features.

**Gaskets and Packing.**—Goetze Gasket & Packing Co., Inc., New Brunswick, N. J. Catalog No. 48, 64 pages, devoted to metallic and semi-metallic gaskets, including new items; sheet and stuffing box packings; sealing compounds; gasket cutting tools; valve disks; filter screens, and metal stampings. Illustrations include blueprint diagrams, as well as halftones. Size and price data are given.

**Abrasive Disks and Wheels.**—Gardner Machine Co., Beloit, Wis. Booklet, 16 pages, attractively illustrating and describing Wire-Lokt abrasive wheels for disk grinders and the company G.I.A. disks. The Wire-Lokt wheels are furnished in two types, the "red rim" for dry grinding only and the "yellow rim" for either wet or dry grinding. The latter are Bakelite boded and are for use at speeds from 6800 to 8500 S.F.P.M. Accessories, including four types of wheels dressers, are also illustrated.

**Canadian Steel Industry.**—Montreal Junior Board of Trade, historical-economic report on the Canadian steel industry, prepared after careful research, and comprehensively treated. Demonstrates that iron and steel industry comprises about 9 per cent of the total productivity of Canada, interesting by comparison with the United States.

**Shipping Terminology.**—Shipping Service Organization, New York. Third and revised edition of Traffic Dictionary, a glossary of terms used in marketing, trade and distribution. Section 1 contains definitions, Section 2 shipping methods information. It is complete and cross-referenced for added convenience.

**Gas Service Stations.**—Austin Co., Cleveland. Catalog showing insulated porcelain enamel service stations in variety of standard designs adopted for 1936. Included are design and layout details of types representative of the modern all steel prefabricated stations built by the Austin Co. Exterior and floor plans indicate the broad adaptability of standardized designs to special conditions.

**Pipe.**—Bethlehem Steel Co., Bethlehem, Pa. Illustrated folder No. 345, recently published covering pipe manufacture from standpoint of quality.

**Building Maintenance.**—Flexrock Co., Philadelphia. Four-page folder devoted to

explaining and describing new roofing process using Longlife, an asphalt roofing material.

**Wire.**—Bethlehem Steel Co., Bethlehem, Pa. Illustrated folder No. 294-A, covering information on minimum weight of coating per sq. ft. of bare wire; Bethanizing classification, and extras applying to manufacturers' basic and bessemer drawn wire; extras per 100 lb. for Bethanized fence fabric and barbed wire; includes few of successful applications of Bethanized wire.

**Die Sets and Accessories.**—Danly Machine Specialties, Inc., 2104 South Fifty-second Avenue, Chicago. Catalog, 112 pages,  $8\frac{1}{4} \times 11\frac{1}{2}$  in., devoted to precision die sets, commercial die sets, large and special semi-steel die sets, all-steel torch cut die sets, die makers' supplies, and welded steel plate machinery members. Convenient indexing as well as attractive illustrations and clear text, is a feature. Each section is thumb indexed, and its dividing board contains an index of each item within the section.

**Track Spikes.**—Bethlehem Steel Co., Bethlehem, Pa. Illustrated folder No. 346 describing track spikes in all standard sizes to any specification from  $5/16 \times 2$  in. to  $3/4 \times 9$  in.; also miscellaneous special sizes. It includes tabulated information on extras for size and quantity.

**Air-conditioning.**—Republic Steel Corp., Cleveland. Circular explaining advantage of Toncan Copper Molybdenum Iron, which resists corrosion, for use in air-conditioning units.

## Calendars

**Wellman Engineering Co.**, Cleveland,  $13\frac{1}{2} \times 30$  in. Three months on one sheet, with large photo reproductions of ore unloaders, cranes, gas producers and other equipment at top of each sheet.

**United Engineering & Foundry Co.**, Pittsburgh,  $16 \times 31\frac{1}{2}$  in. Three months on one sheet. Top of each sheet is illustrated with photo reproductions of 56-in. continuous hot-strip rolling mill, 44-in. blooming mill, 1000-ton slab shear, rolls and other rolling mill equipment.

**Cooper-Bessemer Corp.**, Mount Vernon, Ohio,  $19\frac{1}{2} \times 28$  in. Six different colored sheets with four months on each sheet, illustrated with large photo reproductions of gas and Diesel oil engines, compressors and other products of the company.

**Link-Belt Co.**, Chicago,  $14\frac{1}{2} \times 24\frac{1}{2}$  in. With photo reproductions of vibrating screens, Shafer self-aligning roller bearings, silver link roller chain drive, shovel-crane drag line and other equipment on each sheet.

**Koppers Co.**, Pittsburgh,  $12\frac{1}{2} \times 26\frac{1}{2}$  in. Illustrated with coke oven and other equipment installations of the company in industrial and other plants.

**New Departure Mfg. Co.**, Bristol, Conn.,  $16 \times 30$  in. Three months on each sheet with one large illustration of ball bearings and a variable speed transitory on card-board at top.